AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

Entered as second-class matter at the postoffice, Dalton, Ga., under act of March 3, 1879.

Volume 87
Number Eight
$1.00 a Year.

JUNE, 1923

Published monthly by
W. R. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

Is Your Electrical System

OR

HUNTINGTON & GUERRY
TROUBLE PROOF
ELECTRICAL INSTALLATIONS

IF IT'S H & G. TROUBLE-PROOF, THERE WILL BE NO QUESTION AS TO IT'S ECONOMY, EFFICIENCY, DEPENDABILITY AND SAFETY. — H. & G. ELECTRICAL INSTALLATIONS ARE GOOD FROM THE INSIDE OUT. — THEY ARE MAKING PRODUCTION EASY FOR MORE THAN TWO-MILLION HAPPY SPINDLES TODAY — THEY CAN HELP YOURS TOO

HUNTINGTON & GUERRY
INCORPORATED
GREENVILLE, S.C.

H & G TROUBLE-PROOF ELECTRICAL INSTALLATIONS

What We Mean by

"Quality, Delivery, Prices"

QUALITY—Few textile men today question the quality of Franklin dyeing. There is too much evidence to prove the indisputable superiority of Franklin colors. Many converters now insist that their goods be Franklin dyed. Ten years ago this company was nothing more than an experimental laboratory in Providence; today it has three large plants in the United States and one in England and is the largest user of fast vat dyes in this country.

If these facts are not sufficient to convince you, we suggest that you send for our color card of vat dyed yarns so that you can determine first hand how brilliant, how solid and how completely penetrated Franklin colors are.

We will also be glad to refer you to a list of our customers if you so desire.

DELIVERY—Because the Franklin Process is more rapid than skein or warp dyeing, because it requires less time to handle wound yarn than skein or warp yarn, because we have a combined capacity of over 230,000 lbs. per week we can ordinarily give you better than average service on deliveries. If you are equipped to do so, you can shorten considerably the time the yarn is in our hands, by winding the yarn onto Franklin tubes before you ship it to us. We will sell or rent you tubes for this purpose.

PRICE—In Spite of the High Quality of Franklin Dyeing, we can frequently save you money on the actual cost per pound of the dyeing. But the more important saving is the fact that Franklin packages are so much more easily handled than skeins. You have no backwinding in your mill. On request we will be glad to quote you prices on individual colors. As to the saving which the Franklin Process will effect in your mill, the only way to determine the importance of this is to send us a sample order.

FRANKLIN PROCESS CO.

Philadelphia **PROVIDENCE** **Manchester, Eng.**

New York Office, 72 Leonard St.

SOUTHERN FRANKLIN PROCESS CO.

Greenville, S. C.

BUYING EXPERIENCE

When you install Northrop Looms you are buying the experience

OF THE USERS OF OVER 400,000 LOOMS

Who have, during the past 30 years, been meeting and solving the Weaving Problems presented by practically every kind of One-Shuttle Weave.

THE NORTHROP LOOM OF TODAY

is the result not merely of the years of research and experiments of our inventors, engineers and practical loom-builders. Into it has been built the combined experience of the practical operators in the mills. Refinements, improvements and finishing touches have been developed by our large force of trained experts and service men who have been in daily touch with these practical mill workers.

EXPERIENCE AND COOPERATION

Between the Loom manufacturer and the Cloth manufacturer during more than 30 years of the great growth of the Textile Industry in America have made the Northrop Loom. It has been tested in the fire of practical use. As it has served others, so will it serve you.

LET'S TALK IT OVER.

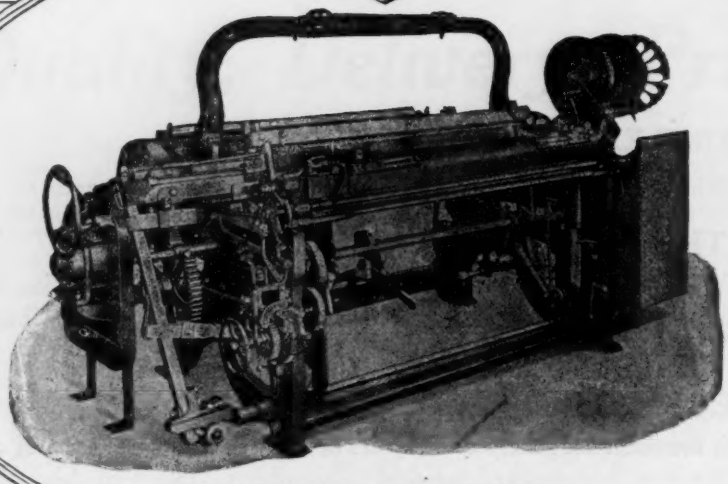
Men have come and men have gone; but the Draper organization is ever-growing in experience, power and disposition to serve the industry. Our Salesmen and Experts are at your service.

DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

SOUTHERN OFFICE ATLANTA GEORGIA

Copyright 1917 by Draper Corporation



Stafford bobbin-changing plain goods loom.

Stafford Looms Increase Production

We manufacture a complete line of automatic looms, both shuttle and bobbin-changing for weaving practically every type of fabric that can be made with a single shuttle. ¶ Stafford shuttle-changing looms will handle cop filling just as successfully as bobbin filling. We have a loom for every kind of yarn, coarse or fine, and for practically every variety of fabric, plain or fancy.

THE STAFFORD COMPANY
WEAVING MACHINERY
READVILLE, MASS.

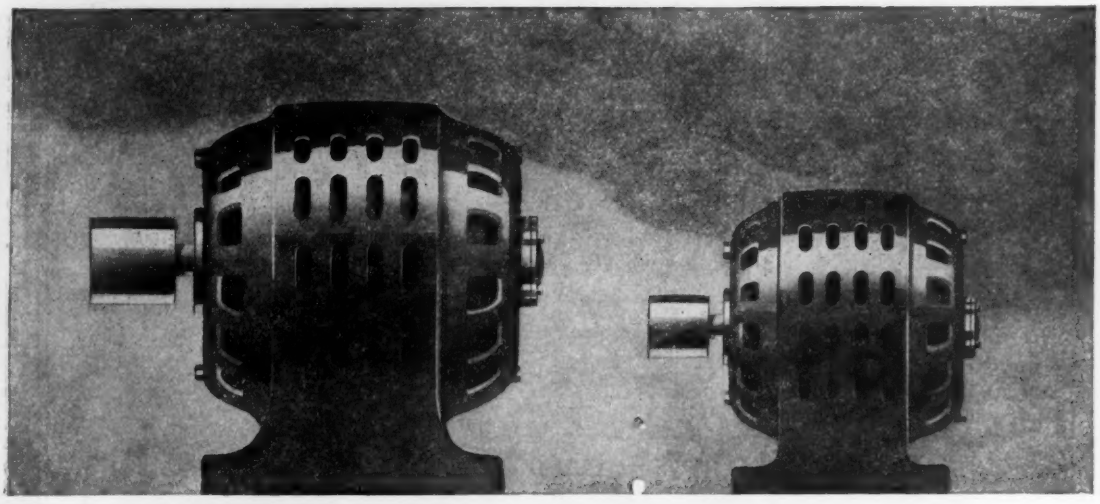
Branch Office
502 Colt Building
Paterson, N. J.

Southern Agent
J. H. Mayes
Charlotte, N. C.

Canadian Representative
Whitehead, Emmans, Limited
Montreal

AUTOMATIC
STAFFORD
LOOMS

Made Under
SKF
Supervision



Making 6500 Kilowatt-Hours do the Work of 10,400

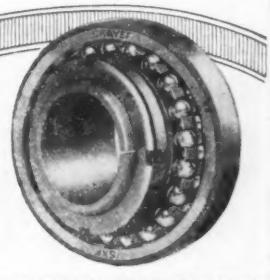
A SHOP equipped with plain-bearing hangers on its line-shafting consumed 10,400 K.W.-hours per month with a maximum demand of 75 K.W. A changeover to Skayef self-aligning ball bearing equipment was made and it was found that only 6500 K.W.-hours per month were required to do the same work and that the maximum demand dropped to 39.9 K.W. This saving in power consumption with ball bearing equipment reduced the yearly cost of power from $4992 to $4173 — a saving of $819 or 19.4 per-cent. This saving is typical of what one may expect from a changeover to self-aligning ball bearing line-shaft equipment.

The reduced power consumption is primarily due to the SKF marked self-aligning ball bearings used in Skayef hanger equipment. These bearings have two rows of highly polished steel balls operating between hardened races of steel, the inner race, balls and retainer being free to turn within the outer race like a ball and socket joint. This makes the bearing practically frictionless and immune from appreciable wear, not only when well aligned but also under conditions of misalignment that are so likely to occur in line shafting.

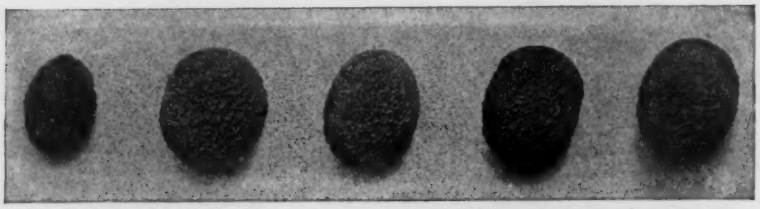
May our engineers give you an estimate on the saving which ball bearing equipment will effect for you, and make definite recommendations for a changeover.

Stock-Carrying Agents in all Principal Cities

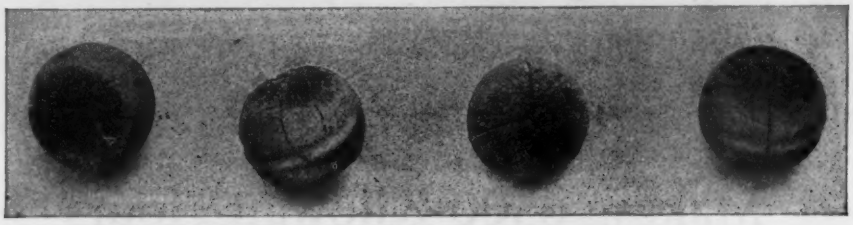
SKAYEF
Self-Aligning
Ball Bearing
HANGERS
(IMPROVED TYPE)



THE SKAYEF BALL BEARING COMPANY
165 Broadway New York City



Fafnir Turned Balls deeply etched in hot hydrochloric acid. No sign of cracks.



Cold Headed Balls (not Fafnir) deeply etched in hot hydrochloric acid. Note cracks revealed. All of these balls had been passed by inspectors.

Hot Forged Balls (not Fafnir) deeply etched in hot hydrochloric acid. Note cracks revealed. All of these balls had been passed by inspectors.

The Bearing User Wants UNIFORM Ball Bearings Not Two or More Poor Ones Out of Every Hundred

Our investigation has shown that in the past the balls have invariably been the weakest part of the bearing. Consequently we have directed our energies to the development of better balls. As the result, we have found turned balls to be far superior to all others.

One has only to glance at the above photographs to see that the profound mechanical deformation which the steel suffers in cold heading or hot forging balls causes severe initial internal strains and stresses which are liable to produce cracks that will cause premature fatigue and failure when the balls are placed in service.

When balls are turned, on the other hand, the normal condition of the steel is perfectly preserved and, consequently, there is no danger of fatigue.

The "Dragon" for June tells the whole story. Ask us to send you a copy.

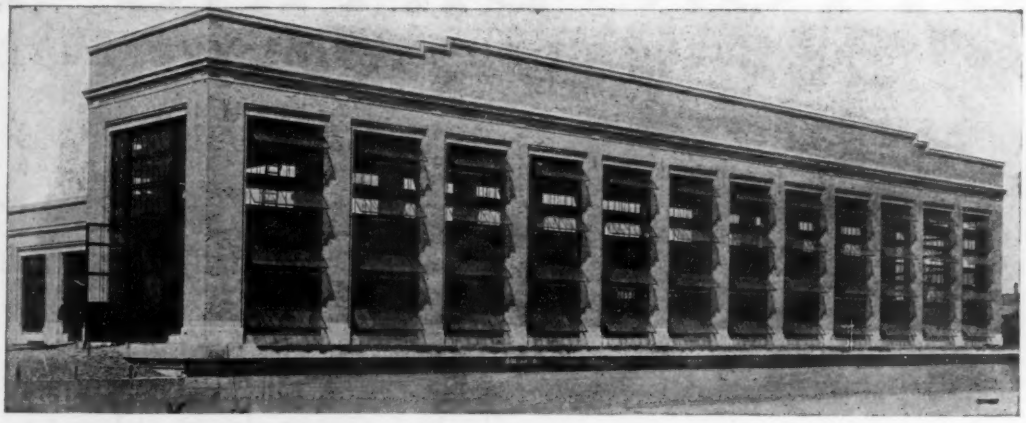
THE FAFNIR BEARING COMPANY

(Conrad Patent Licensee)
New Britain, Conn.

Southern Representatives

O. R. S. Pool,
Box 1375,
Greenville, S. C.

S. M. Smith,
P. O. Box 1423,
Greensboro, N. C.



Power House, Henry Ford & Son, Green Island, N. Y. Stone & Webster, Engineers and Contractors.

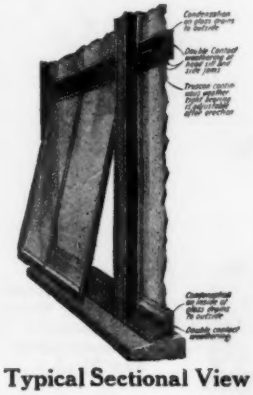
Truscon Continuous Sash

TRUSCON Continuous Sash installed in pressed steel frames is the outstanding feature in the architectural design in the Henry Ford & Son Power House, Green Island, N. Y. Incidentally 150,000 sq. ft. of Truscon Standard Windows daylight a mammoth tractor plant near this power house. Repeat orders are the best assurance of the customer's confidence.

The principle of manufacture makes the pressed steel frames far superior to those made from "break metal." Every member is accurately fitted and smoothly finished. Strength and rigidity, as well as beauty, are outstanding qualities.

In monumental structures the design centers around the window. Truscon windows fill every requirement in architectural and structural design. The ventilator units in the large openings may be mechanically operated under group control by means of tension type mechanical operators. The arrangement and size of lights may be made to conform with individual requirements.

Truscon windows with pressed steel frames are designed for each job. Engineers and architects consult our engineering service when making layouts and designs.



Typical Sectional View

Truscon Continuous Sash in Pressed Steel Frames are adaptable for any large opening in monumental buildings.

Truscon Steel Company

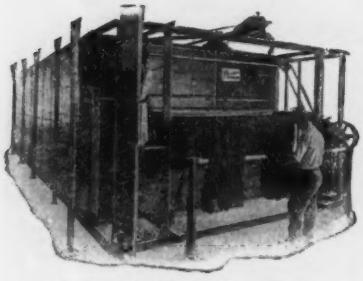
Youngstown Ohio

Sales and Engineering Offices in Principal Cities

TRUSCON STEEL WINDOWS

COTTON DRYING &

STOCK, YARN, PIECE GOODS & HOSIERY DRYERS

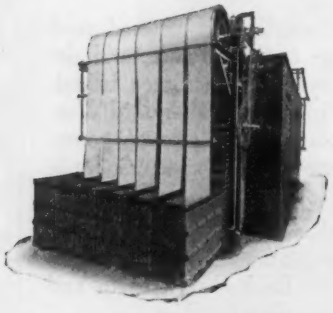


Automatic Skein Yarn Dryer

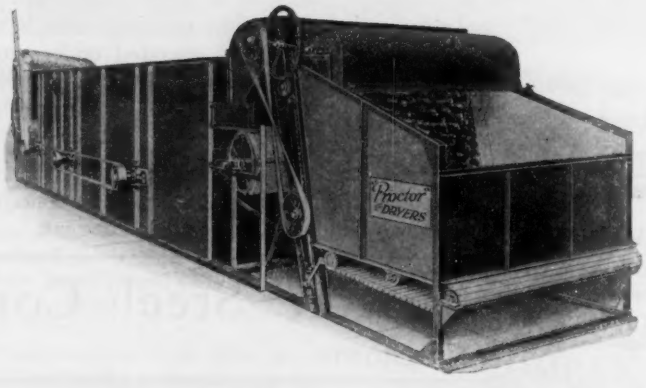
As builders of Drying Machinery, this organization is quite generally and favorably known—

For forty years, "Proctor" Dryers have served with distinction in a vast number of cotton dyeing, bleaching and finishing plants, as well as in every other branch of textile production wherein drying is required.

The sustained praise of hundreds of satisfied users of "Proctor" Dryers, has made the makers' name the traditional guide to all that is best in drying machines for raw stocks, yarns, piece goods and hosiery; also in housings for tentering machines.



Automatic Loop Dryer for Knit and Other Piece Goods



Single Conveyor Dryer for Dyed and Bleached Cotton, Linters and all other Raw Stock.

PROCTOR • & •

formerly THE PHILADELPHIA TEXTILE MACHINERY CO.

PHILADELPHIA,

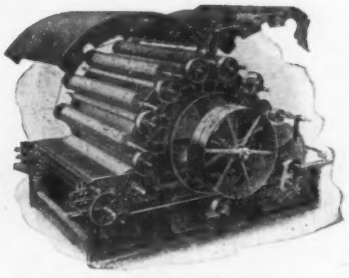
WASTE MACHINERY

CARDS-WILLOWS-RECLAIMERS-FELTING OUTFITS

Now the name Proctor & Schwartz, Inc., should also be remembered as the sole makers of the "Smith-Furbush" line of Cotton Waste and Felting Machinery.

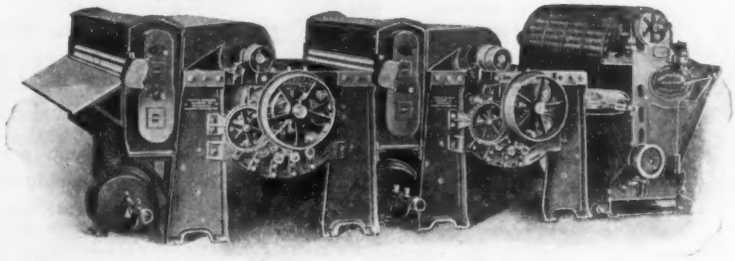
This extension of products resulted from the recently effected merger of Smith & Furbush Machine Company and Proctor & Schwartz, Inc., under the latter name.

The "Smith-Furbush" products include Carding Machines, Garnetts, Pickers, Shredders, Pullers and Reclaimers—in fact, complete equipment for opening, cleaning, carding and spinning cotton waste into yarns of the coarser grades; also for making batts of all kinds.



Cotton Waste Card

Cotton Waste Cleaning Outfit

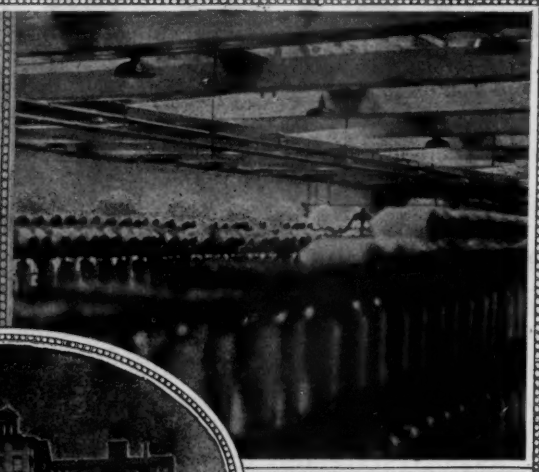


Shaughnessy Cotton Waste Reclaiming Machine

SCHWARTZ, INC.

and SMITH & FURBUSH MACHINE COMPANY

PA.



THE AUGUSTA FACTORY
Augusta--Georgia
JACOB PHINIZY, Pres.

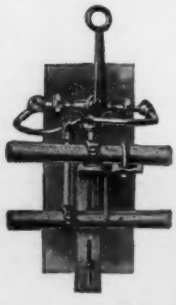
Shirtings, Sheetings,
Drills, Duck
40,192 Ring Spindles
870 Looms

Air Conditioning For Low Posted Mills

No air conditioning device will apply universally. Humidifying problems vary. To solve these varying problems our line of devices is as complete as an engineering experience of two generations can make it.

In mills of this character the units of delivery of moisture must be small—not too much moisture in one place—and more of them. But—they should not obstruct light. They should completely vaporize the water; should not require frequent attention.

The ParkSpray Turbo installation fulfills all these requirements—and more.



Convenient hose outlets make compressed air available for cleaning of machinery and inaccessible places;—a very valuable "by-product."

Whether the Turbo Humidifier is best adapted to your particular problem is a matter of engineering study. If it isn't you can't buy it. But varying in length of service, more than 100,000 are in use, testifying to their durability and reliability.

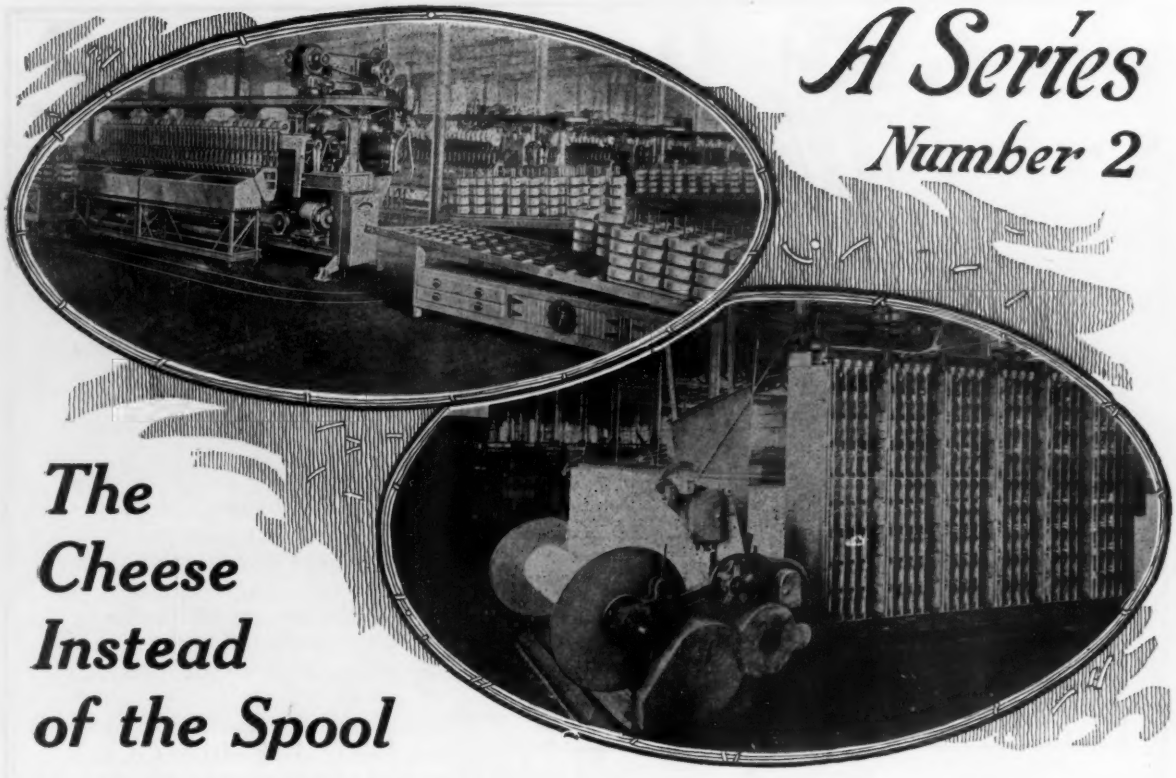
When you want an air conditioning problem solved you are not so much concerned in the device as in—will it be solved right. No single air conditioning device will apply universally.

Bulletins 522 and 722 are more complete in detail

Parks-Cramer Company

Engineers & Contractors
Industrial Piping and Air Conditioning

Fitchburg Boston Charlotte



A Series Number 2

The Cheese Instead of the Spool

The Barber-Colman process of Spooling makes a yarn package known as a "cheese" and accomplishes automatically the work done by spooler girls with hand knotters.

The yarn is wound criss-cross, making it possible to build up a self-sustaining yarn mass upon a headless spool or core.

The human element is eliminated and spooler kinks reduced to zero.

The cheeses are handled on tridents in groups of twelve and are not touched by hand until the creel girl picks up the loose end in creeling the warper. This makes cleaner yarn with no damaged cheeses as is caused by the old method of handling spools.

The tension of the yarn wound on cheeses is much less both on the spooler and the warper which results in less breakage and fewer knots, better work on the slashers and straighter warps in the looms. Less stoppage of the looms means greater production.

A Full Cheese and a Starter

The Trident with Twelve Cheeses

FULL DATA SENT ON REQUEST

BARBER-COLMAN COMPANY

ROCKFORD, ILL.

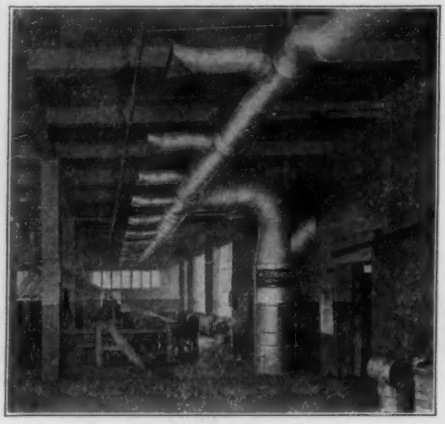
BOSTON, MASS. **GREENVILLE, S. C.**

BARBER-COLMAN SYSTEM OF SPOOLING AND WARPING

AUTOMATIC SPOOLER *with* WEAVERS KNOTTER

HIGH SPEED WARPER

Experience



Just as Edison put electricity to work and Watt put steam to work, so B. F. Sturtevant, sixty years ago, made the first "blower," thus harnessing Air to the service of mankind.

Pioneers in the design and manufacture of air-moving apparatus, the Sturtevant Co. maintains an extensive research and laboratory service for the continual development and improvement of various systems wherein air is put to work.

When designing air-conditioning systems, the W. L. Fleisher Co. has all the vast experience and knowledge of the B. F. Sturtevant Co. upon which to draw.

Our air-conditioning specialists will gladly co-operate with you and make recommendations—without the slightest obligation.

SALES OFFICES

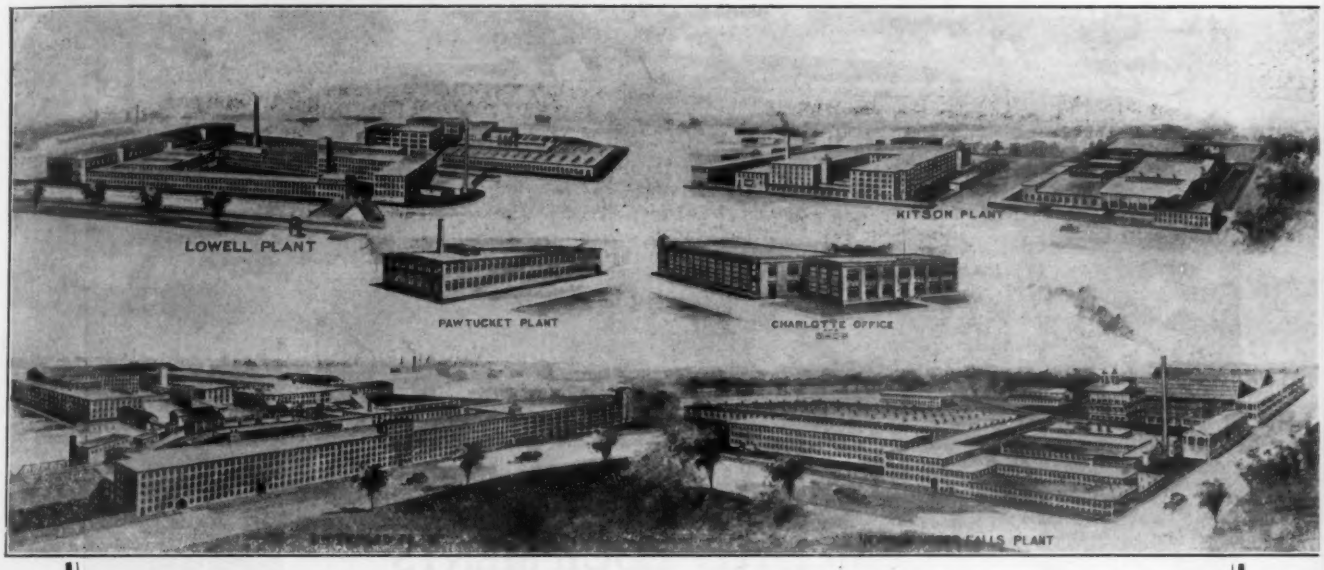
Atlanta	Detroit	Portland
Boston	Hartford	Rochester
Buffalo	Los Angeles	St. Louis
Chicago	Minneapolis	Salt Lake City
Cincinnati	New York	San Francisco
Cleveland	Philadelphia	Seattle
Dallas	Pittsburgh	Washington

Sturtevant
PUTS AIR TO WORK
HYDE PARK, BOSTON, MASS.

W. L. FLEISHER & CO., Inc.
31 Union Square West
NEW YORK, N. Y.

725

Saco-Lowell Service



BULLETIN NO. 6

Our New Charlotte Office and Shop

We are pleased to call your attention to the sixth plant in the above group. This plant is located on South Mint and Commerce Streets, Charlotte, N. C. This plant is the beginning of many plans for improving our service to Southern mills, and from time to time we expect to advise you as these plans mature.

At this date we are glad to advise you that with double equipment in a modern, well lighted shop building, we are prepared to rewind twice as many Lickers-in and reclothe twice as many card flats as heretofore. In this class of repair work for all makes of revolving flat cards, our workmanship and service cannot be excelled.

We shall be pleased at all times to have representatives of Southern mills inspect our new plant and offices, when in Charlotte.

To those of you who are not sending us your flats and lickers-in, we shall be pleased to quote our prices for this class of work.

TRY THIS SERVICE

Saco-Lowell Shops

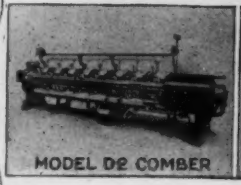
CHARLOTTE, N. C.

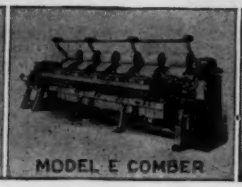
WHITIN MACHINE WORKS

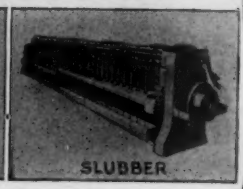
ESTABLISHED 1831

TEXTILE MACHINERY

MAIN OFFICE AND WORKS, WHITINSVILLE, MASS., U.S.A.







Manufacturers of

COMPLETE EQUIPMENTS

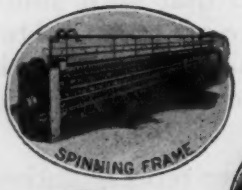
for Making

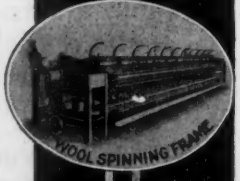
YARNS

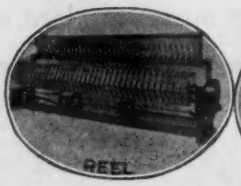
from

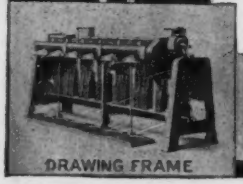
COTTON, COTTON WASTE, WOOL, ASBESTOS, ETC.

Descriptive Circulars on Request









POSTAL TELEGRAPH – COMMERCIAL CABLES

CLARENCE H. MACKAY, PRESIDENT

TELEGRAM

DELIVERY NO. 106

RECEIVED AT MAIN OFFICE 49-51 NORTH BROAD STREET (GRANT BUILDING) ATLANTA, GA. PHONE: BELL, CALL "POSTAL."

This is a fast Telegram unless otherwise indicated by signal after the number of words.—"Blue" (Day Letter) "N.L." (Night Letter) or "Nite" (Night Telegram)

STANDARD TIME INDICATED ON THIS MESSAGE.

16—76863

203 AGY 1035A 19

DANVILLE VA MAY 7 1923

THE MURRAY CO. # 540

ATLANTA GA

LETTER RECEIVED ENTER ORDER TWELVE MURRAY CLEANING MACHINES SHIP FOUR QUICK ALSO ENTER THREE BALING PRESSES SHIP ONE QUICK

RIVERSIDE AND DAN RIVER

12 More

Repeat orders for any machine is pretty good evidence that that machine is RIGHT. Repeat orders for Murray Cotton Cleaning and Aerating Machines are coming in daily from mills who have given it a thorough trial. The above telegram is one of them.

The Riverside & Dan River Mills of Danville, Va., ordered two Murray Machines for trial purposes, which proved so satisfactory that 12 more were ordered by telegram with which to equip their entire mill properties. These machines will be used for opening and cleaning various kinds of cotton, and some of them to work on cotton after it has been dyed and rebaled.

A trial will convince you that the Murray, a machine which thoroughly cleans and aerates the cotton without injuring the fibre, is the machine which you have long wanted.

Ask for full information today.

THE MURRAY COMPANY

ATLANTA, GA.

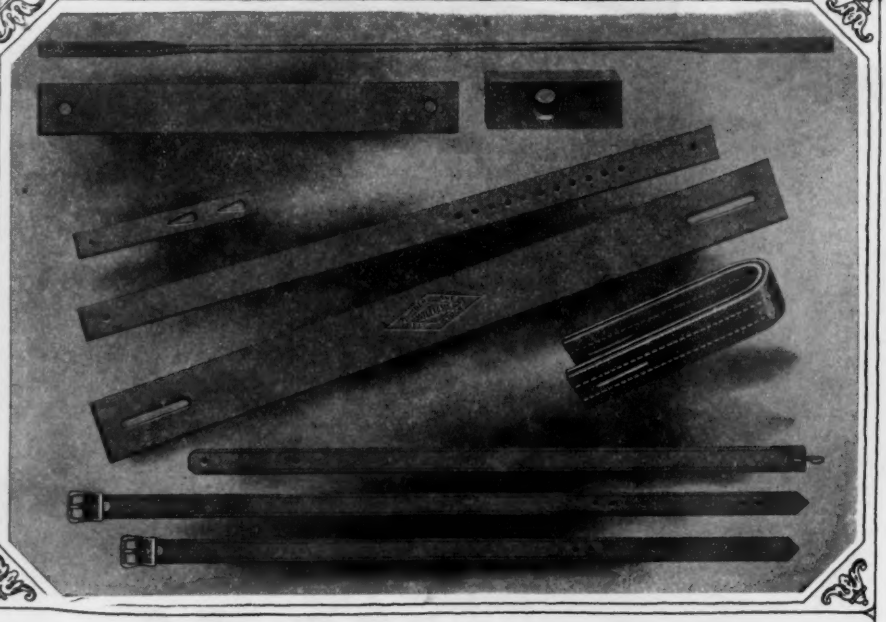
COTTON WELL OPENED IS HALF SPUN

The Murray

(PAT. PENDING)

COTTON CLEANING AND AERATING MACHINE

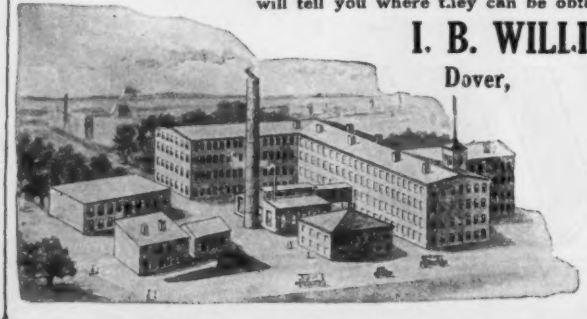
WILLIAMS MILL STRAPPING



Real, Old Fashioned Quality Leather That Has Stood The Tests of 80 Years

The leather used in making our famous Cocheco Belting has long been known for its high quality, for the old-fashioned care and thoroughness used in every stage of its production. It is carefully selected lots of this same leather from which our straps are cut. Our check straps, for instance, are cut from heavy, belt stock—the finest leather, for the purpose, obtainable. Williams' mill straps are proving a revelation to mill men everywhere, because of the superior service they are giving.

Ask your dealer for Williams' straps. Write us if he cannot furnish them and we will tell you where they can be obtained.



I. B. WILLIAMS & SONS

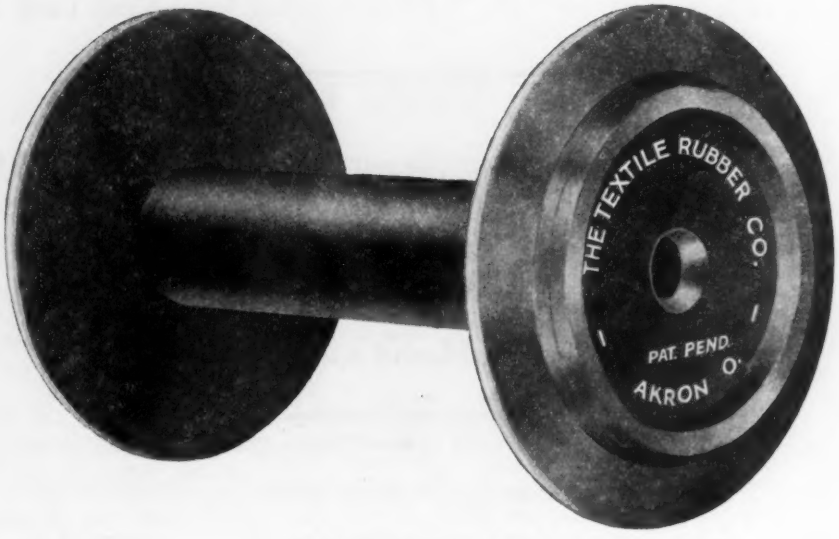
Dover, New Hampshire

NEW YORK BRANCH
71-73 Murray St.

CHICAGO BRANCH
14-16 No. Franklin St.

BOSTON BRANCH
157 Summer St.

The First Hard Rubber Spool



Interchangeable WITH WOODEN SPOOLS

The superior qualities of hard rubber makes it the most ideal material possible for perfect textile spools.

It assures a spool that cannot be broken, splintered, bent or dented, even when given the roughest treatment.

It assures a spool with a perfectly smooth finish with no seams or projections to catch the yarn—a finish that will never wear rough.

It assures a spool whose heads will not loosen.

It assures a spool that will never warp, as moisture and climatic conditions have no effect upon it.

Test it yourself, and prove to your own satisfaction that it is the most perfect and economical spool possible.

Samples gladly sent to textile mills on request.

THE TEXTILE RUBBER CO.
225 OHIO BLDG.
Akron, Ohio

HUNTER
MANUFACTURING & COMMISSION CO.,

58-60 Worth Street New York City

Selling Agents for

Southern Cotton Mills

Fabrics for Home and Export

Domestic Branch Offices

Boston Chicago San Francisco Philadelphia
Baltimore St. Louis Greensboro
Cleveland Atlanta Kansas City

Foreign Branch Offices

Buenos Aires, Argentina
Baranquilla, Colombia
San Juan, Porto Rico
Curacao, D. W. I.
Havana, Cuba
Caracas, Venezuela
Manila, P. I.

SOLE DISTRIBUTORS
to the
JOBBING TRADE
for the
DURHAM HOSIERY MILLS

ALABAMA OFFERS

Health, Happiness and Prosperity

Alabama's Death Rate is Low

In 1921—9.8% (OFFICIAL STATE RECORDS) **In 1922—11.1**

—AS COMPARED WITH OTHER STATES :

Connecticut	13.6%	New Hampshire	15.2%
Maine	15.4%	Rhode Island	14.3%
Massachusetts	13.8%	Vermont	15.8%

(*Government Census Figures*, 1920)

DR. S. W. WELCH, Alabama, State Health Officer, in a recent communication to Dr. D. B. Armstrong, made the following statements relative to health conditions in Alabama:

"Alabama now has no serious malaria or typhoid problems. The state is practically free from deadly respiratory diseases, such as pneumonia and pulmonary tuberculosis; goitre is practically unknown; four times as many children per 100,000 population, die of scarlet fever in New York and Massachusetts as in Alabama. Twice as many die of tuberculosis in these states yearly, per 100,000 population, as in Alabama."

ARMSTRONG CORROBORATES WELCH'S STATEMENT—

Dr. D. B. Armstrong, Secretary of the National Health Council, in a denial of press reports of his recent address before the Boston Chamber of Commerce, said:

"I am fully aware of the health progress that the South has made, and am among those who believe that this constitutes one of its greatest economic assets.

"Under the leadership of such State Health Commissioners as Hayne, of South Carolina; Dowling, of Louisiana; Rankin, of North Carolina; McCormack, of Kentucky; Crittenden, of Tennessee; Leathers, of Mississippi; Harrison, of Arkansas, and WELCH of ALABAMA, accomplishments in the field of disease prevention have been nationally conspicuous. These include:

"The bringing of the hookworm under gradual but effectual control.

"The certain early relegation of malaria to the problems of accomplished history.

"The vigorous attack upon the tuberculosis problem; the questions of infant welfare, etc.

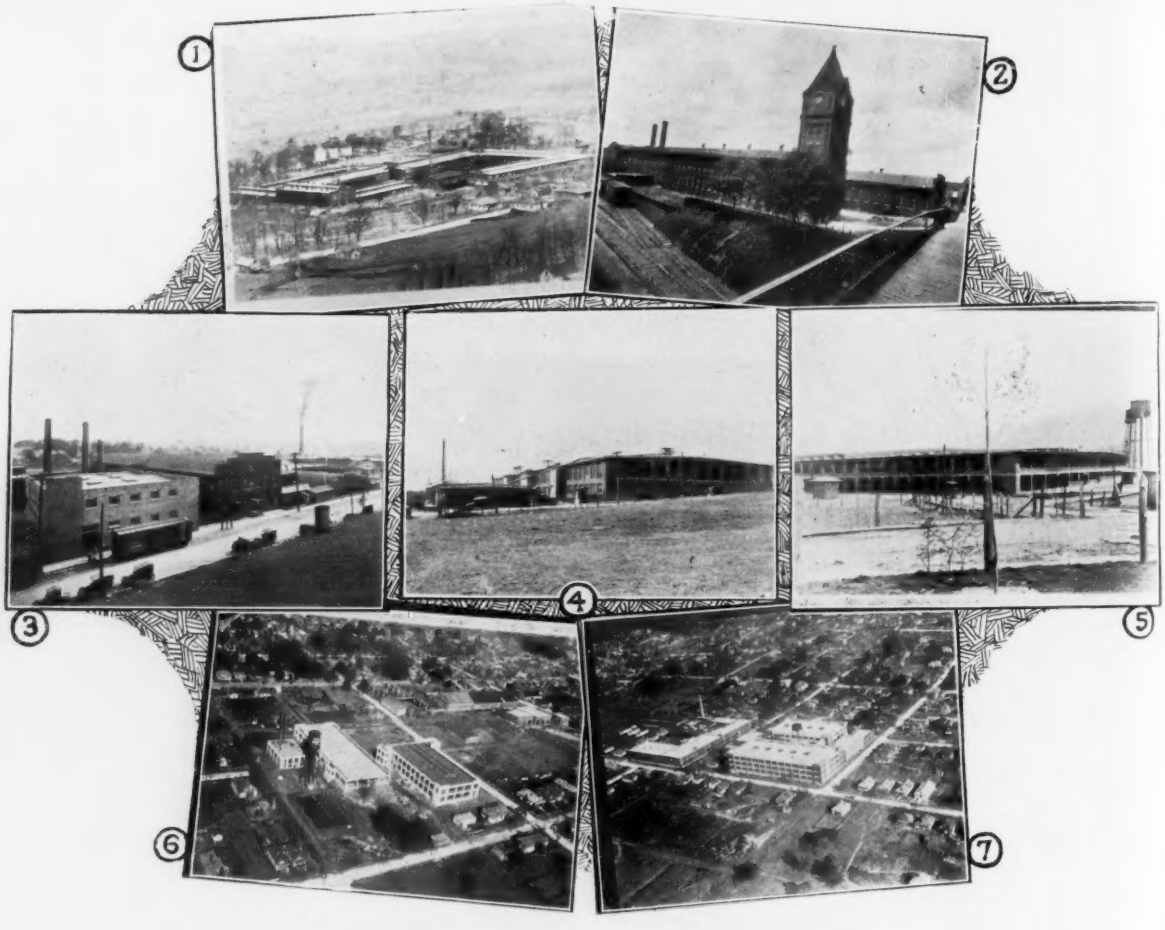
"Remarkable provision in many neighborhoods for the welfare and health of industrial workers."

MAKE IT IN HEALTHFUL ALABAMA

Alabama Power Company

BIRMINGHAM, ALA.

Tennessee-The Hea



A Few of Tennessee's Textile Mills

No. 1—United Hosiery Mills, Capital and Surplus $4,000,000. 1200 Knitting Machines.
No. 2—Knoxville Spinning Co., Capital Stock $450,000. 30,000 spindles.
No. 3—Appalachian Mills, manufacturing men's underwear and cotton hosiery yarns. Capital stock $1,300,000. 10,500 spindles.
No. 4—Cherokee Spinning Co., Capital stock $1,000,000. 15,000 spindles.
No. 5—Prendergast Cotton Mills, 20,160 spindles. Capital stock $225,975.
No. 6—Dixie Mercerizing Co. Capital stock $1,000,000.
No. 7—Standard Coosa Thatcher Co., Spinning and Mercerizing plants. Capital stock $5,000,000. 56,000 spindles.

The Tennessee El

art of Industrial America

Tennessee's Mills Are All Prospering

Eastern Tennessee is already a great center of diversified textile manufactures. Close to one hundred and fifty mills are successfully operating in the state today. These include practically every branch of the industry—hosiery, underwear, cotton spinning and weaving, woolen and worsted yarn, mercerizing and dyeing, bleaching and finishing mills together with numerous garment plants. Tennessee has the largest mercerizing center in the South, producing annually 8,000,000 pounds of mercerized yarns, and one of her principal cities within the short space of thirty-three years has become the second largest producer of hosiery in the entire country.

What does this mean? In the first place it means that mills which have commenced operations within comparatively recent years have prospered in this section. It means also that Tennessee is not restricted or limited to any one phase of textile manufacture. And finally it means that mills which must depend upon other branches of the industry for co-operation can find such assistance here.

Tennessee's mills are all prospering because manufacturing costs in Tennessee are lower than elsewhere. Close proximity to the sources of raw materials, an adequate supply of intelligent and stable labor, abundant electric power facilities and unexcelled rail and water transportation make it possible to manufacture and market textile products at minimum cost.

At your request we will gladly furnish complete information showing why Tennessee is the logical location for your new mill or branch unit.

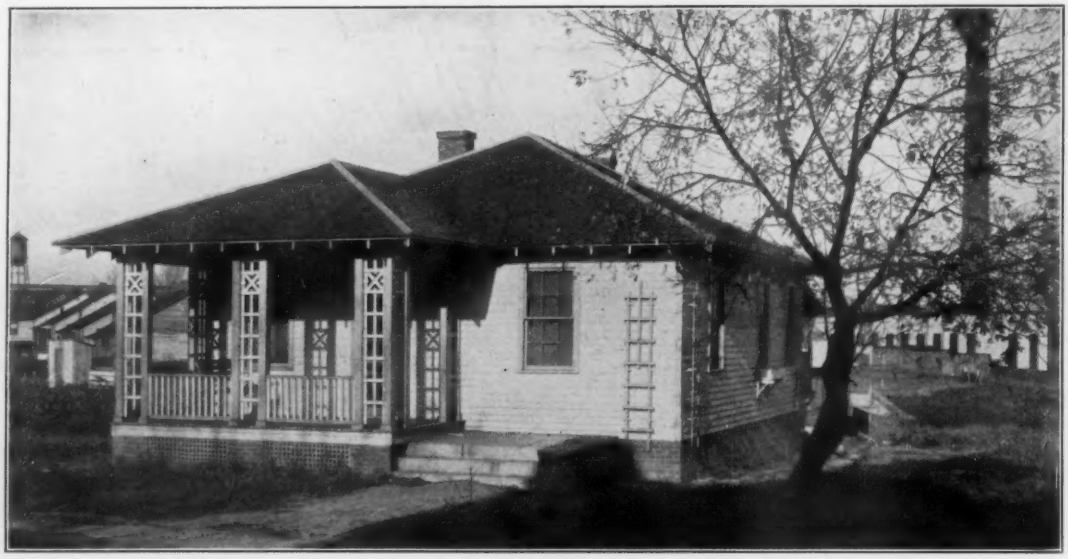
THE TENNESSEE ELECTRIC POWER COMPANY

CHATTANOOGA, TENNESSEE

FIVE ADVANTAGES IN TENNESSEE

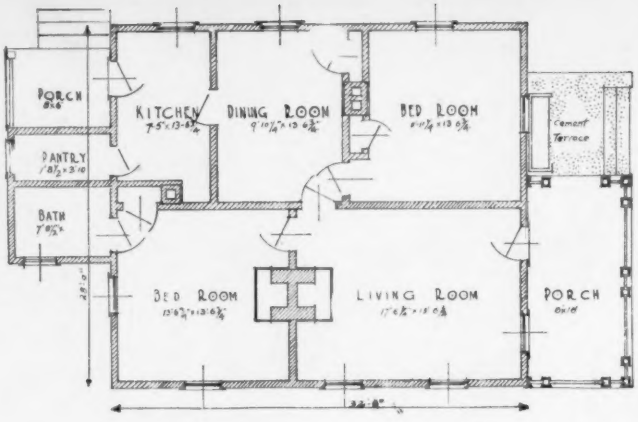
1. Ideal climate the entire year.
2. Raw materials of all kinds in abundance.
3. Market facilities — unsurpassed rail and water transportation.
4. Ample supply of intelligent and stable labor.
5. Continuous and reliable electric power at low cost.

Electric Power Co-



ABOVE—Photograph showing one of the 27 Minter Homes recently erected for the Hermitage Cotton Mills, Camden, S. C.

AT RIGHT—Floor plan showing room arrangement of this pleasing and comfortable home.



Minter Methods Please Cotton Mill President

"What has been the experience of other Cotton Mill people who have erected Minter Homes?" is a question which you naturally ask before finally deciding on Minter Homes for your employees.

Mr. R. B. Pitts, President and Treasurer of the Hermitage Cotton Mills, Camden, S. C., helps us to answer that question by writing us as follows: "Your men have completed the twenty-seven homes for which we placed contract with you and the job is satisfactory to us in every way and we are well pleased with the entire transaction."

Let us submit more evidence—or better still, let us estimate with you on the new homes that you plan to build.

THE MINTER HOMES COMPANY
GREENVILLE, SOUTH CAROLINA
MINTER HOMES CORPORATION
HUNTINGTON, WEST VIRGINIA

HERMITAGE COTTON MILLS
CAMDEN, S. C.

October 9th, 1922.

The Minter Homes Company,
Greenville, S. C.

Gentlemen:

Your men have completed the twenty-seven homes for which we placed contract with you and the job is satisfactory to us in every way, and we are well pleased with the entire transaction.

Yours very truly,
Hermitage Cotton Mills,
R. B. Pitts
Pres. and Treas.

152 T.

THE FUN-FUL LINE
PLAYGROUND EQUIPMENT

349 Cotton Mills Using FUN-FUL!

A few of them

Pacific Mills—Columbia, S. C.
Columbia Mills—Columbia, S. C.
Wymojo Mills—Rockhill, S. C.
Woodside Mills—Greenville, S. C.
Pacolet Mills—Pacolet, S. C.
Drayton Mills—Spartanburg, S. C.
Monarch Mills—Union, S. C.
Langley Mills—Langley, S. C.
Grendel Mills—Greenwood, S. C.
Greenwood Mills—Greenwood, S. C.
Belton Mills—Belton, S. C.
Loray Mills—Gastonia, N. C.
Gray Mills—Gastonia, N. C.
Arlington Mills—Gastonia, N. C.
Flint Mills—Gastonia, N. C.
Cannon Mills—Kannapolis, N. C.
P. H. Hanes Mills—Winston-Salem, N. C.
Proximity Mills—Greensboro, N. C.
Durham Mills—Durham, N. C.
Roxboro Mills—Roxboro, N. C.
Tolar-Hart-Holt Mills—Fayetteville, N. C.
Hart Mills—Tarboro, N. C.
Pilot Mills—Raleigh, N. C.
Cardinal Mills—West Point, Miss.
Lauderdale Mills—Meridian, Miss.
Danville Mills—Danville, Va.
Schoolfield Mills—Schoolfield, Va.
Bonham Mills—Bonham, Texas.
Sherman Mills—Sherman, Texas.
Corsicana Mills—Corsicana, Texas.
Itasca Mills—Itasca, Texas.
Brazo Valley Mills—West, Texas.
Prendergast Mills—Prendergast, Tenn.
Davis Mills—Chattanooga, Tenn.
Avondale Mills—Birmingham, Ala.
Lanett Mills—Lanett, Ala.
Anniston Mills—Anniston, Ala.
Montgomery Mills—Montgomery, Ala.
Fulton Bag Mills—Atlanta, Georgia.
Exposition Mills—Atlanta, Georgia.
Calloway Mills—LaGrange, Georgia.
Moultrie Mills—Moultrie, Georgia.
Trion Mills—Trion, Georgia.
LaFayette Mills—LaFayette, Georgia.
Bibb Mills—Macon, Georgia.
International Mills—LaGrange, Georgia.

At the Brazilian Centennial Exhibition at Rio de Janeiro, Brazil, South America, which has just closed, HILL-STANDARD Equipment was awarded the gold medals.

Catalog on request

HILL-STANDARD CO.

Anderson, **Our 22nd year** Indiana

Let Us Add Your Name To This List

OUR service to textile mills is the result of years of experience in installing textile theatre equipment. Our representatives call upon the mills personally, lay out the plans, advise on the proper equipment required and finally supervise the installation and the starting of the theatre. In other words, they take the whole problem off your hands and do not turn over the work to you until the theatre is operating satisfactorily.

The textile industry is demanding the best moving pictures for their employees and that is why they regularly specify POWER'S PROJECTORS.

That is why more Power's Projectors are used by textile mills in the South than all other projectors combined.

We carry a complete line of supply parts and equipment at our various branches. Your orders for supply parts will be filled the same day the order is received. Whatever are your needs for your theatre, we can supply them.

We have a special offer for Textile Mills. May we present it to you?

Satisfied Users of POWER'S PROJECTORS

ALABAMA

W. A. Handley Mfg. Co.	Roanoke
Tallassee Mills	Tallassee
Fairfax Mill	Fairfax
Avon Mills	Sylacauga
Lanett Cotton Mills	Lanett
Indian Head Mills	Cordova
Selma Mfg. Co.	Selma
Buck Creek Cotton Mills	Siluria

GEORGIA

Elm City Cotton Mills	LaGrange
Bibb Mfg. Co.	Porterdale
Roswell Mfg. Co.	Roswell
Gainesville Cotton Mill	Gainesville
Bibb Mfg. Co.	Columbus
Pacolet Mfg. Co.	New Holland
Manchester Cotton Mills	Manchester
Milstead Mfg. Co.	Milstead
Thomaston Cotton Mills	Thomaston
Exposition Cotton Mill	Atlanta
Habersham Mill	Habersham
Trion Company	Trion
Union Point Mfg. Co.	Union Point
Hillside Cotton Mill	LaGrange

NORTH CAROLINA

Durham Hosiery Mills	Durham
Pamona Mills	Greensboro
Cleveland Mill & Power Co.	Lawndale
Rodman-Heath Cotton Mills	Waxhaw
Rocky Mount Mills	Rocky Mount
Cherokee Falls Mfg. Co.	Cherokee Falls
Roxboro Cotton Mills	Roxboro
Consolidated Textile Corp.	Burlington
Carolina Cotton & Woolen Mills	Spray
Erwin Cotton Mills	Duke
Cannon Manufacturing Co.	Kannapolis

SOUTH CAROLINA

Baldwin Cotton Mills	Chester
Tucapau Mills	Tucapau
Ware Shoals Mfg. Co.	Ware Shoals
Glenn-Lowry Mfg. Co.	Whitmire
Monaghan Mills	Greenville
Drayton Mills	Spartanburg
Victor Mills	Greer
Conestee Mills	Conestee
Kershaw Cotton Mills	Kershaw
Abbeville Cotton Mills	Abbeville
Chesnee Mills	Chesnee
Union-Buffalo Mills	Buffalo
Victor-Monaghan Mills	Seneca
Victor-Monaghan Mills	Jonesville
Pacolet Mfg. Co.	Pacolet
Aragon Mills	Rockhill
Graniteville Mfg. Co.	Vancluse
Woodside Cotton Mills	Greenville
Orr Cotton Mills	Anderson
Issaqueena Mills	Central
Clifton Mfg. Co.	Clifton
D. E. Converse Co.	Glendale
Winnsboro Mills	Winnsboro
Monarch Mills	Lockhart
Republic Cotton Mills	Great Falls

Southern Theatre Equipment Company

WILLIAM OLDKNOW, President.

100 Walton St.
ATLANTA, GEORGIA

THREE TWENTY-EIGHT CALIFORNIA ST.,
OKLAHOMA CITY, OKLA.

Eighteen Fifteen Main St.
DALLAS, TEXAS

Look for the *hidden* capacity first

Before deciding definitely to build an addition, it is always well to consider the possibility of increasing the capacity of your present plant.

Recently we were asked to prepare plans for an addition to a large mill. On going over the plant we found that by a re-arrangement of machinery it was possible to effect a considerable saving of space. Our recommendations were adopted and the manufacturer was able to increase his production with a much smaller addition than originally was contemplated.

Building With Foresight

This is but one example of what Lockwood-Greene service can accomplish. We have designed changes that have effected savings in fuel. We have discovered power losses and corrected them. We have increased employee efficiency by improving working conditions. We have cut production costs by improving methods.

Each of these accomplishments is the result of a special study backed by a long experience in similar work. Lockwood, Greene & Co. offer a completely rounded engineering service for the solution of problems arising from expansion, contraction, or reorganizing of business.

Whatever your problem may be, Lockwood, Greene & Co. can be of service. A copy of the booklet, "Building with Foresight," describing typical Lockwood-Greene operations, will be sent on request.

LOCKWOOD, GREENE & CO.

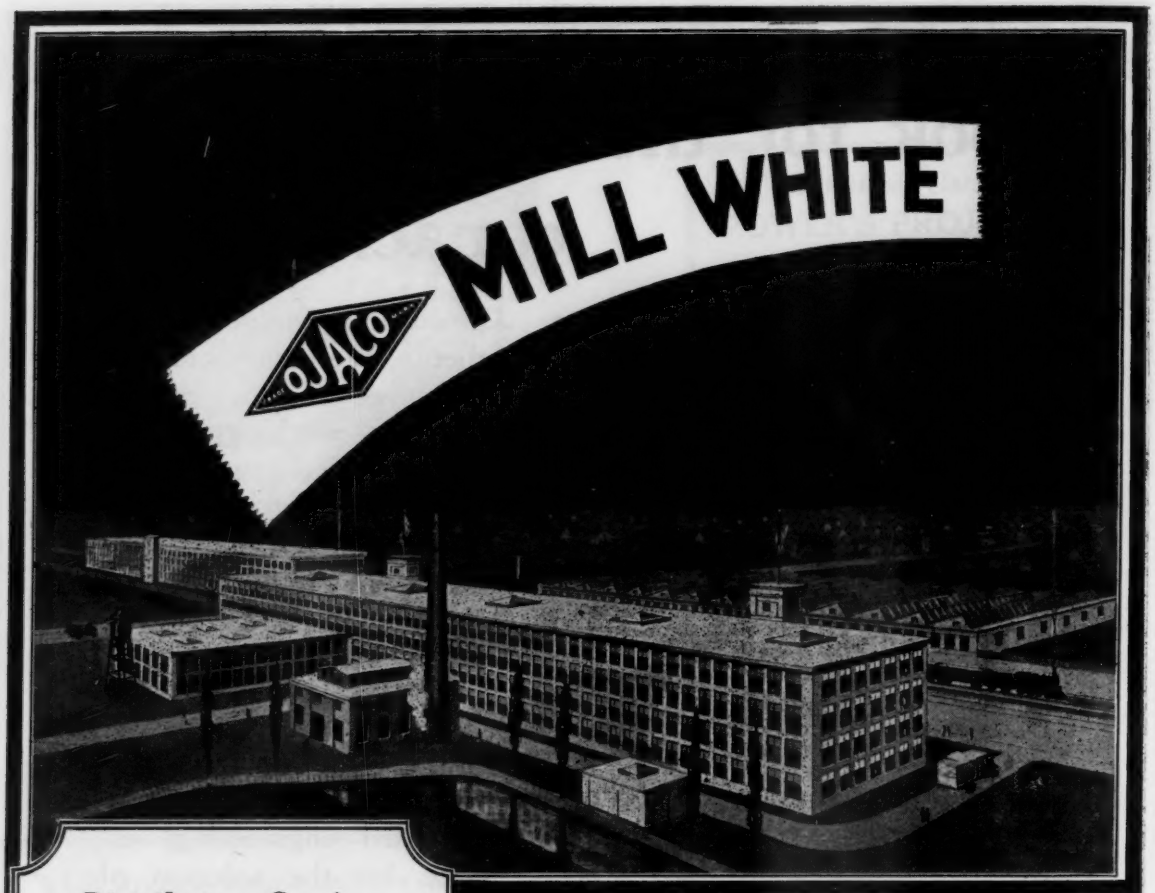
ENGINEERS

EXECUTIVE OFFICE, 24 Federal Street, Boston 9

Boston Atlanta Chicago New York Detroit Cleveland Charlotte

Lockwood, Greene & Co. of Canada, Limited, Montreal

Compagnie Lockwood Greene, Paris, France



Distributor Service

BOSTON, MASS.
Lewis E. Tracy Co.

CHARLOTTE, N. C.
Charlotte Supply Co.

FALL RIVER, MASS.
Wm. F. Harticon

HOLYOKE, MASS.
J. Russell & Co.

ROCHESTER, N. Y.
F. P. Van Hosen Co.

SYRACUSE, N. Y.
Alexander Grant's Sons & Co.

UTICA, N. Y.
American Hard Wall Plaster Co.

WOONSOCKET, R. I.
J. B. Farnum Co.

"Save the surface and you save all"

For Better Mill Interiors

IN the manufacture of textiles, well-lighted interiors are as necessary as skilled help and modern machinery.

OJACO Mill White **insures** better mill interiors. It eliminates all glare and shadows. It transforms every square foot of floor space into usable working area.

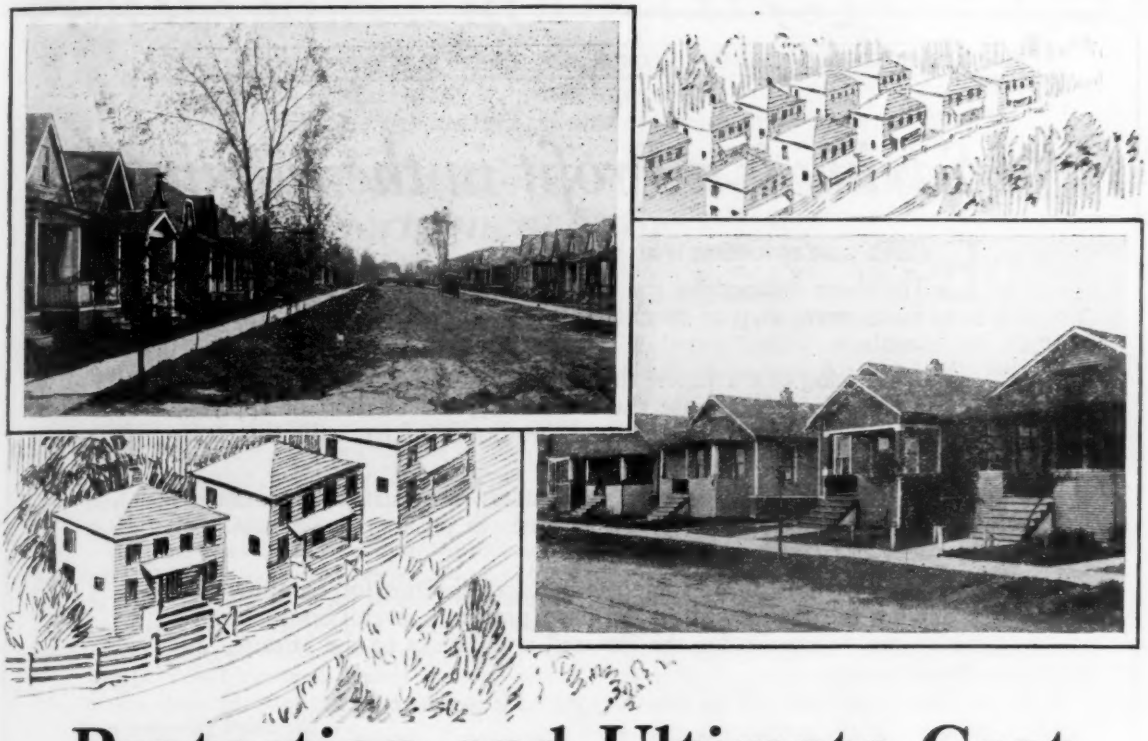
Wherever OJACO Mill White is applied to the walls and ceilings of textile mills, the result is better and more economical illumination; improved workmanship; greater production at less cost.

Consult the nearest OJACO Distributor listed opposite for further particulars

Oliver Johnson & Co., Inc.

Paint Makers since 1833

PROVIDENCE, R. I.



Protection and Ultimate Cost

In the selection of paint for protection the experienced buyer determines value through just one consideration—the service records of that paint over a period of years.

For it is a demonstrated fact that money spent for paint brings back its fullest value only when proven worth has been the determining factor in the selection of that paint.

DEGRACO PAINTS
All Colors for All Purposes

DEGRACO PRODUCTS

- Superior Graphite Paint
- Sta-White
- Degraco House Paint and Varnish
- Degraco-Tone-*Flat wall finish*
- Degraco Brick and Concrete Paint
- Anti-Aqua-*Damp-proof coating*
- Degraco Gas Holder Paint
- Degracolin-*Concrete floor hardener*
- Degraco Enamels
- Industrial Finishes

On this basis it is not surprising that DEGRACO HOUSE PAINTS are so widely known and used in the Textile Field for the protection of employee's houses.

The biggest and most exacting buyers use DEGRACO HOUSE PAINTS because of demonstrated value—definite assurance of durability with low yearly painting costs.

You can use DEGRACO HOUSE PAINTS with assurance of all around paint satisfaction. Your experience will demonstrate the truth of this statement once you have used them.

DETROIT GRAPHITE COMPANY
555 Twelfth Street Detroit, U. S. A.

DEGRACO PAINTS are sold through branch offices with warehouse stocks in all principal cities.

Manufactured in Canada by Dominion Paint Works, Limited, Walkerville, Canada.

DEGRACO
All Colors for All Purposes

PAINTS
VARNISHES
ENAMELS

THE FUNCTIONS OF THE ENGINEER

A Saving is a Profit in the Making

EVERY cost reduction is an added profit.

The more competitive the field of industry the more important it is to make every step of manufacture as economical and as effective as possible.

The grouping of machines; the layout of departments; the character of the structures that house the machinery; the method of applying power and of generating it, have a profound influence, by the economies they effect, on the balance sheet.

In this field, the Engineer, by his studies, analysis and recommendations, may open entirely new avenues to profit, that will make of his fee a lucrative investment.

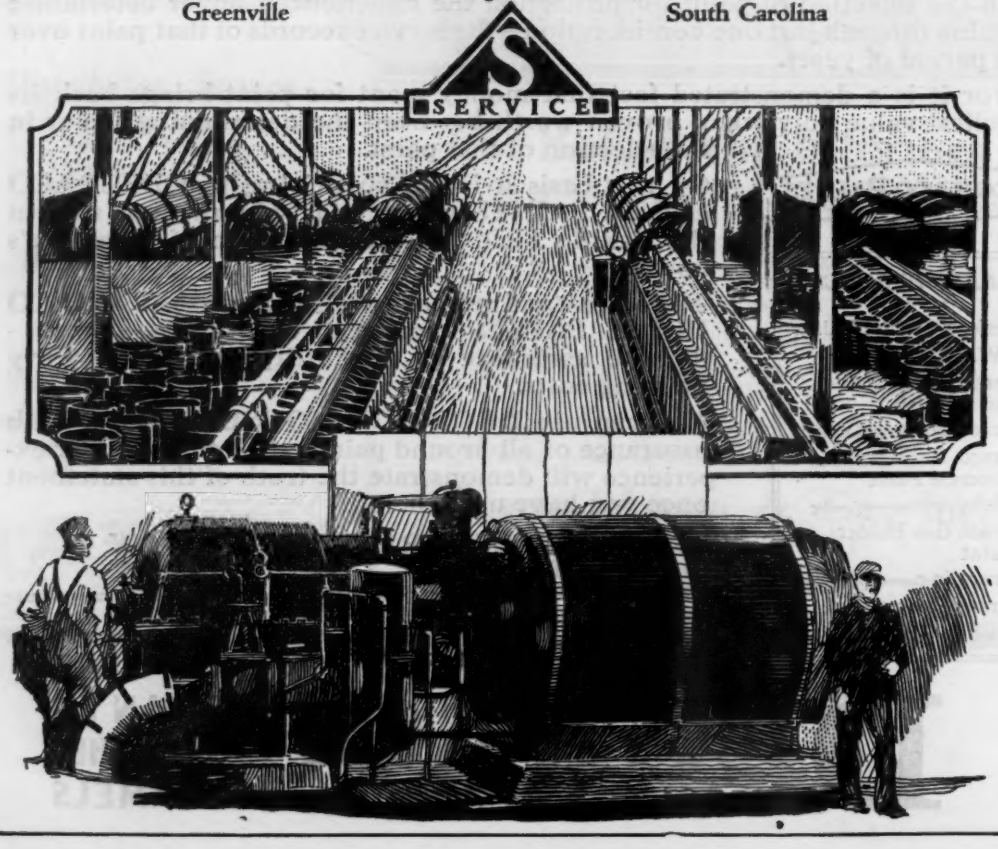
By way of illustrating some of these possibilities for economy and profit for the manufacturer, we have prepared several books, among which are "Factories for the Future" and "Picks to the Minute," on textile plants.

Either or both will be sent to your address on request.

J. E. SIRRINE & CO.

Engineers

Greenville **South Carolina**



PERMANENT ROOF CONSTRUCTION

A series of articles by the Technical Staff of the Richardson Research Laboratories, showing what modern science has done to perfect the materials and methods of roof construction

No. 3. How waterproofing bitumen is made *permanent* at the refinery

How can you be sure *beforehand* that the waterproofing bitumen you put on your roof will endure? Most asphalts look alike on the surface, but which ones will resist year after year of heat, rain, snow, and gruelling strain to which all buildings are subject?

Of course there are several physical tests which waterproofing bitumens must undergo to prove their fitness. Yet inferior bitumens can be doctored sufficiently to "get by", just as poor mixtures of concrete may pass the inspector yet break down later under strain.

But the years of service your waterproofing will give, although indicated by certain physical tests, is really determined by the proper balance of its chemical parts at the refinery. Such equilibrium is one of nature's vital laws, applying to all phases of life. You, for example, would die in a moment if the chemical constituents of your blood were not correctly balanced.

Working with these important facts in mind, the Richardson Research Laboratories have produced a waterproofing bitumen which not only passes the required physical tests, but is also *chemically balanced*, and thus is immune from future deterioration. The name of this unique product is Viskalt.

Permanence built from within

The first step in getting this proper chemical balance in Viskalt is to secure the best raw material.

Many waterproofing bitumens are derived from crude petroleums which contain only small quantities of actual asphaltum. In an effort to obtain from these petroleums every drop of gasoline, lubricating oils, etc., many processes of refining are so destructive that they leave in the asphaltic residuum high percentages of harmful constituents —asphaltic acids and anhydrides—which later destroy its waterproofing value.

Thus, although a bitumen of this kind may be doctored to pass the physical tests, it is sure to break down later under weather attacks.

Viskalt, on the other hand, is derived from an asphaltic base petroleum found only in certain parts of Mexico and containing more than 80% asphaltum. Thus, since asphaltum is the *main* product, special care is taken in refining to keep it free from harmful constituents. Viskalt therefore, is able not only to pass the physical tests but also to hold together *permanently* in spite of severe weather attacks.

Ordinary waterproofing bitumen, moreover, is often injured through unscientific methods of refining. Overheating or burning, for example, produces *carbenes*, aptly termed the tubercular germ of waterproofing. Although the physical tests may not reveal this hidden menace, leaks which later develop on the roof betray it only too clearly.

Viskalt, on the contrary, is refined with steam up to a certain temperature and then air condensed under vacuum. In this way, all the desirable constituents are retained, especially the asphaltic resins so necessary to its stability and long life. Physical tests of Viskalt are thus really significant. You can be sure that it hides no malignant carbenes to work later damage to your roof.

Such delicate refining processes as Viskalt undergoes—critical temperatures, the control of vacuums, the fine regulation of a treated air stream which carries off unwholesome greases and acids—these can be properly controlled only by university trained, experienced chemists. Of such is the staff of the Richardson Refineries.

You can thus see how all these factors combine to make Viskalt truly stable, cohesive, pliant under stress or temperature changes—not merely as shown by physical tests but according to an inner chemical balance. Because of this, Viskalt provides you with a waterproofing bitumen *permanent* through years of hard service.

For further facts about the basic principles of *permanent* roof construction, consult the article for next month.

Viskalt is made by a firm backed by over fifty years of manufacturing experience. There is a Viskalt compound for every waterproofing need. For complete specifications just write the Construction Materials Division, Dept. 000.

The RICHARDSON COMPANY

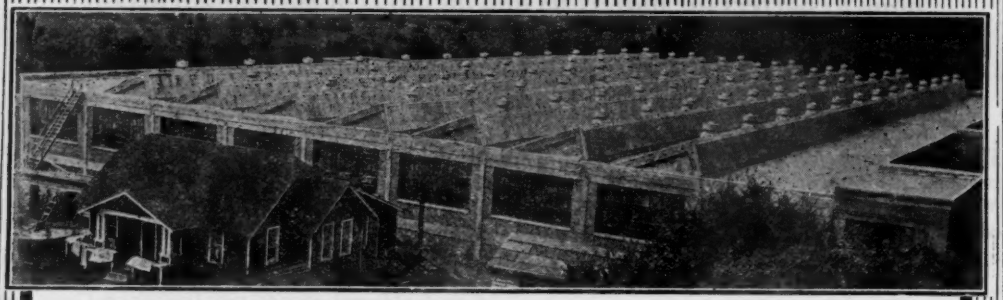
Dept. 44 C, Lockland (Cincinnati), Ohio
Melrose Park (Chicago), Illinois New Orleans, La.

Viskalt
Pliant Under Stress

RICHARDSON *Product*
"1868"
From the makers of Richardson Roofing (including Flex-a-Tile Housetops), Viskote, Wallboard and similar products

© 1923, The Richardson Company

For better concrete—SLAG



This modern reinforced slag concrete weave shed was erected in 1920 for the Columbus Manufacturing Co. (Columbus, Ga.) by T. C. Thompson Bros & Co. (Charlotte, N. C.); Lockwood-Greene Co. of Atlanta, designing engineers.

More proof! The Pacific Mills of Boston, Mass., will use 16,000 tons of

"ENSLEY" & "ALA CITY"
BASIC SLAG
CRUSHED & SCREENED

in the construction of their $5,000,000 plant at Duncan, S. C.

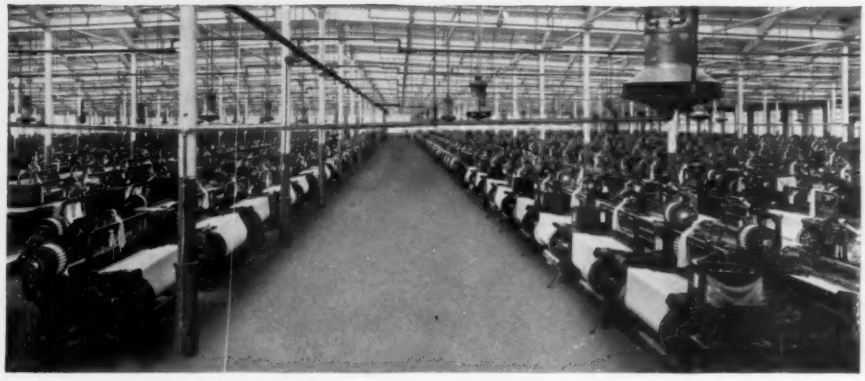
The entry of the Pacific Mills into the Southern field is emphasized by the letting of contracts for one of the largest textile plants in the Southeastern states.

Plans call for five main structures which will be reinforced concrete and the use, as coarse aggregate in the concrete, of 16,000 tons of our crushed and screened Basic Slag.

Slag Concrete is practically Everlasting!

It is a significant fact that the same firm of designing engineers who planned the big reinforced slag concrete weave shed, shown above, in 1920, are actively directing construction of these five million dollar projects for The Pacific Mills. Again—experience, not experiment, points the way to better concrete—with Slag!

Birmingham Slag Company
Slag Headquarters for the South
ATLANTA BIRMINGHAM THOMASVILLE



How to Buy Paint Economically

First:—Buy your mill-white paint from a well-established company that cannot afford to sell anything but the very best product that can be made.

Second:—Get 100 cents for every paint dollar you spend—buy direct from the manufacturer.

Third:—Buy paint that actually stays pure white, and does not turn saffron or yellow after it has been on the wall a relatively short time.

Fourth:—Buy paint that has a real covering capacity and works well both sprayed or brushed on.

Or, to put the thought in two words—"Buy Surlight." It is an interior mill white of the very highest quality, made by a manufacturer of over 20 years standing and sold direct from the factory. Get our prices.

ST. LOUIS SURFACER & PAINT CO., 4211 Arlington Ave., St. Louis, Mo.

SURLIGHT

The Interior Mill White

The Ideal Paint for Mill Villages

Millvill—the paint for mill village homes—is the ideal house and building paint, developed especially for this class of service.

It is manufactured in the paint center of the U.S., by a company over 20 years old, and is sold on a highly economical basis direct from the factory.

Millvill has every desirable quality that a house and building paint should have—it is of uniform consistency, drys with a rich finish and holds its color under rigorous temperature conditions. It spreads well and does not scale, crack, peel or powder.

Furnished in all standard colors or to match any special colors.

Get our direct-from-factory prices on any quantity—also ask for color card.

ST. LOUIS SURFACER & PAINT CO., 4211 Arlington Ave., St. Louis, Mo.

MILLVILL

Paint For Mill Village Homes

The "ABC" of Good Paving—

Asphalt for Filler
Brick for Surface
Crushed rock, gravel, crushed slag or Concrete for Base

and the "D" is drainage—adequate and well-planned

INSIST on A, B, C and D and you have the ideal modern pavement for city street, country road or industrial driveway.

Let's start "from the ground up" and discuss the reasons why. You'll find them decidedly logical.

Drainage, adequate and well-planned is first in importance because there is no type of material or design that can resist the havoc played by faulty drainage with its resultant shifting of sub-soil in spring, summer and autumn and the upward thrust of freezing in the winter. Without adequate drainage the investment quickly becomes an expense.

Next, an adequate foundation—many times a well compacted sandy soil, but more often a sturdy base of concrete, crushed rock, crushed slag or gravel, according to the relative costs and convenience of local sources of supply—overlaid with a uniform bedding course of sand of even density, the whole forming an adequate road-bed when protected from direct impact and abrasion by a top armor of brick.

Third—a vitrified brick surface, because it furnishes the best traffic surface, smooth, yet anti-skid, and because its fire-hardened toughness resists wear and tear so sturdily that upkeep expense is squeezed to a minimum. The margin of slightly higher first-cost is speedily offset by lower maintenance and longer life.

Fourth—asphalt for filler, because asphalt between the brick seals the surface against water entering from above, and provides the proper elasticity required to forestall cracking and subsequent deterioration to which rigid pavements are susceptible, due to temperature and moisture stresses.

The sum of these four items is a pavement flexible enough to accommodate itself to natural forces, with a surface hard, tough, smooth and dense enough to resist the wear, tear and impact of intensive modern traffic.

This is necessarily a rapid-fire description of a problem of major importance. Unless you have had first-hand experience with an "A-B-C pavement", you will want further data and specified figures on cost and performance. These we are glad to supply.

VITRIFIED PAVING Brick
OUTLAST THE BONDS

NATIONAL PAVING BRICK MANUFACTURERS ASSOCIATION
ENGINEERS BUILDING CLEVELAND, OHIO

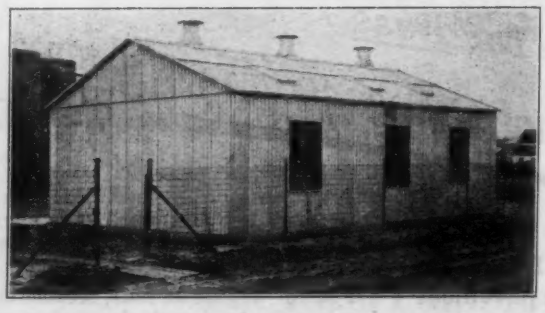
GEORGE DOWMAN

610-611 WALTON BLDG
ATLANTA, GA.

CONTRACTORS AND SALES ENGINEERS

Last a Lifetime!

THE MARYLAND METAL BUILDING PORTABLE YET PERMANENT Lyonore Metal



Maryland Metal Buildings are fabricated of No. 24 gauge Lyonore Metal and will last a lifetime. Fire, weather, wind and lightning-proof they are the ideal buildings for schools, industrial plants, filling stations, pump houses, tool houses, in fact anything from a watchman's booth to a permanent shelter of any kind.

Standardized designs and standard sections reduce material and labor costs.

Maryland Metal Buildings are cheapest in the long run for every requirement. Can be erected quickly by unskilled labor and should you want to dismantle the salvage is 95%.

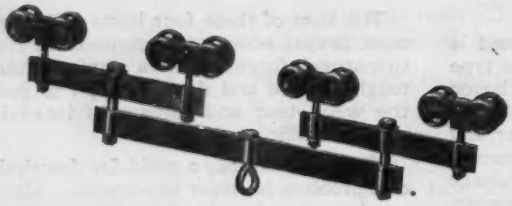
Quick shipment from stock

Write us your requirements.

MARYLAND METAL BUILDING COMPANY

Race & McComas Sts. Baltimore

WAGNER OVERHEAD CONVEYING EQUIPMENT



IS IDEALLY ADAPTABLE TO COTTON MILL OPERATIONS
CONSERVES LABOR---SAVES TIME AND FLOOR SPACE

Do your trucking on the ceiling and consolidate your conveying and hoisting operations.
Wagner Equipment includes a complete line of Switches, Crossovers, Curves, and Cranes. Carriers are equipped with high grade roller bearings and can be furnished with "Hyatt" Roller Bearings if desired.

Write for Catalogue

Wagner Manufacturing Company, Cedar Falls, Iowa.

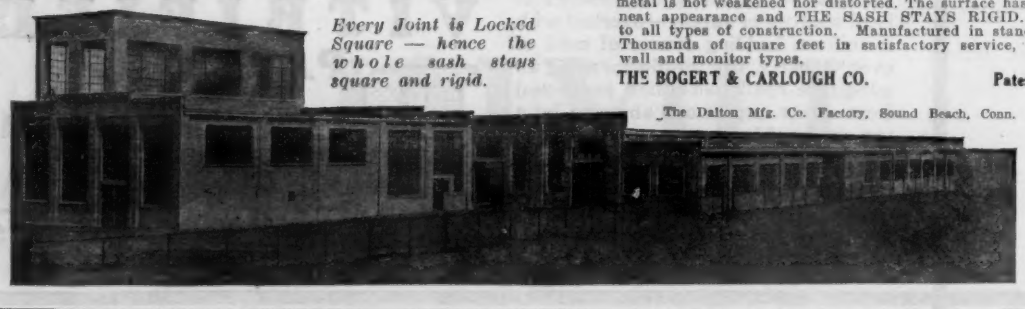
BOCA SOLID STEEL SASH

SOLID STEEL SASH

Every Joint is Locked Square — hence the whole sash stays square and rigid.

Boca Solid Steel Sash is manufactured from special rolled solid steel members. In the Boca Patented Lock Joint, the metal is not weakened nor distorted. The surface has a smooth-neat appearance and THE SASH STAYS RIGID. Adapted to all types of construction. Manufactured in standard sizes. Thousands of square feet in satisfactory service, both side-wall and monitor types.

THE BOGERT & CARLOUGH CO. **Paterson, N. J.**



The Dalton Mfg. Co. Factory, Sound Beach, Conn.

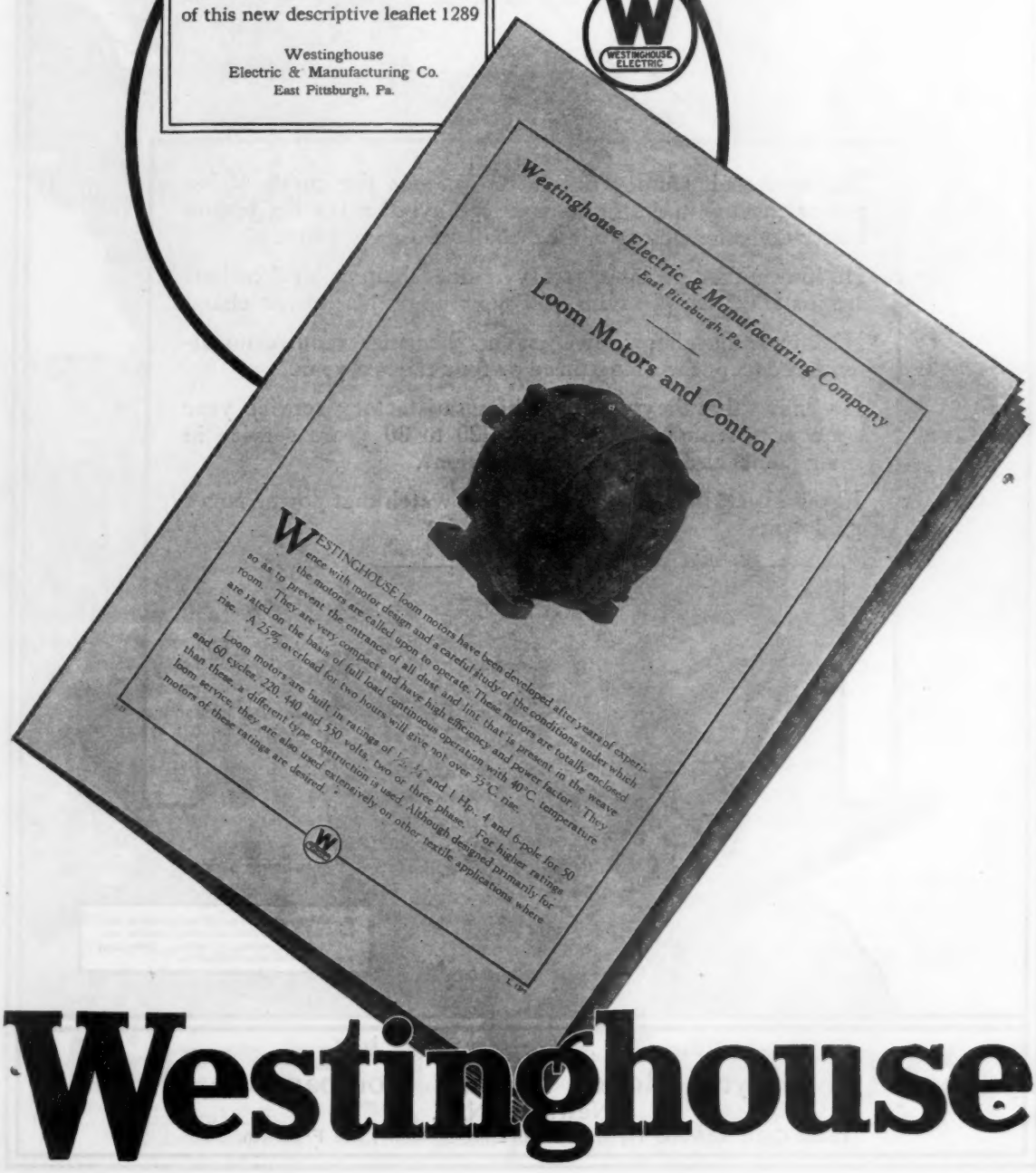
Southern Selling Agent for the Products on This Page—Quality Products plus "Dowman Service"

Describes

the complete line of
Westinghouse
Loom Motors
and Control

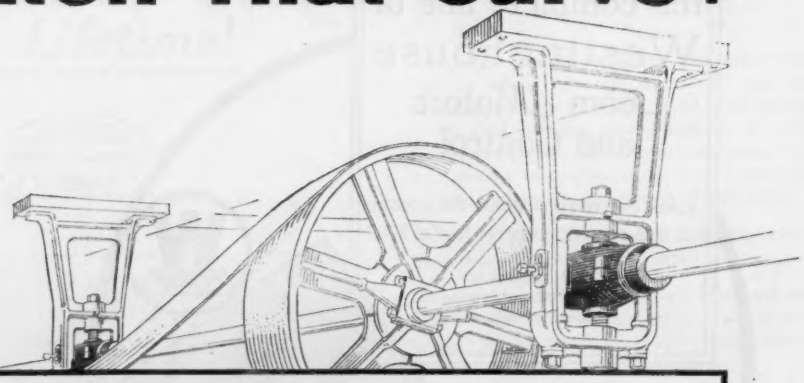
Ask our nearest office for a copy
of this new descriptive leaflet 1289

Westinghouse
Electric & Manufacturing Co.
East Pittsburgh, Pa.


Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.
Loom Motors and Control
WESTINGHOUSE loom motors have been developed after years of experience with motor design and a careful study of the conditions under which the motors are called upon to operate. These motors are totally enclosed so as to prevent the entrance of all dust and lint that is present in the weave room. They are very compact and have high efficiency and power factor. They are rated on the basis of full load continuous operation with 40°C. temperature rise. A 25% overload for two hours will give not over 55°C. rise.
Loom motors are built in ratings of 1/4, 1/2, 3/4 and 1 Hp., 4 and 6-pole for 50 and 60 cycles, 220, 440 and 550 volts, two or three phase. For higher ratings than these, a different type construction is used. Although designed primarily for loom service, they are also used extensively on other textile applications where motors of these ratings are desired.

Westinghouse

Watch That Curve!



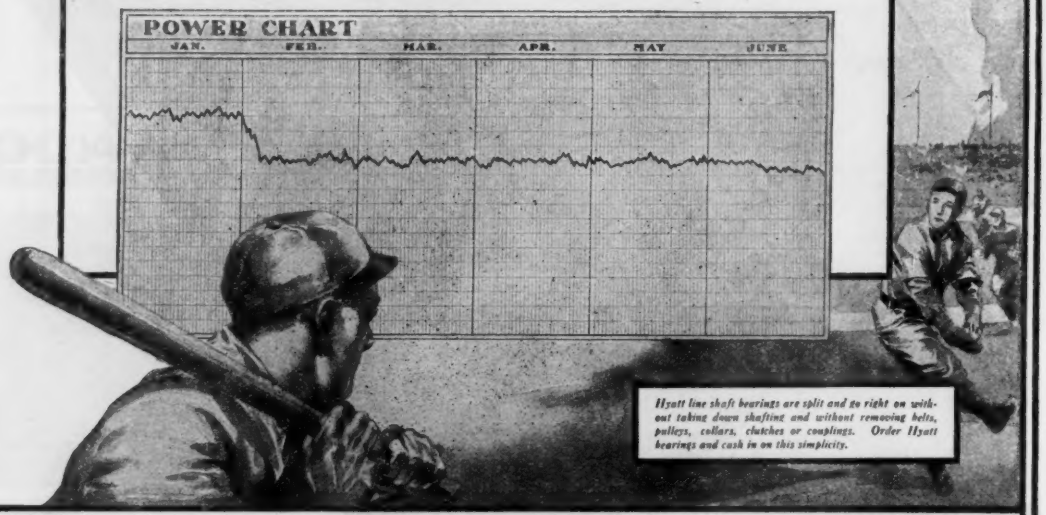
The successful factory executive watches the curve of his power chart with the same practiced eye that the big league batter does the curves of a baseball across the plate.

He knows that as soon as Hyatt line shaft roller bearings are installed a 15% saving will show up on his power chart.

He knows that these power saving bearings require no attention except for oiling three or four times a year.

He knows that they will give him satisfactory service year after year without replacement (20 to 30 years service in some plants and still in good condition).

Install Hyatt line shaft bearings and watch that power curve go down.


POWER CHART
JAN.
FEB.
MAR.
APR.
MAY
JUNE
Hyatt line shaft bearings are split and go right on without taking down shafting and without removing belts, pulleys, collars, clutches or couplings. Order Hyatt bearings and cash in on this simplicity.

'Phone The Nearest Mill Supply Dealer

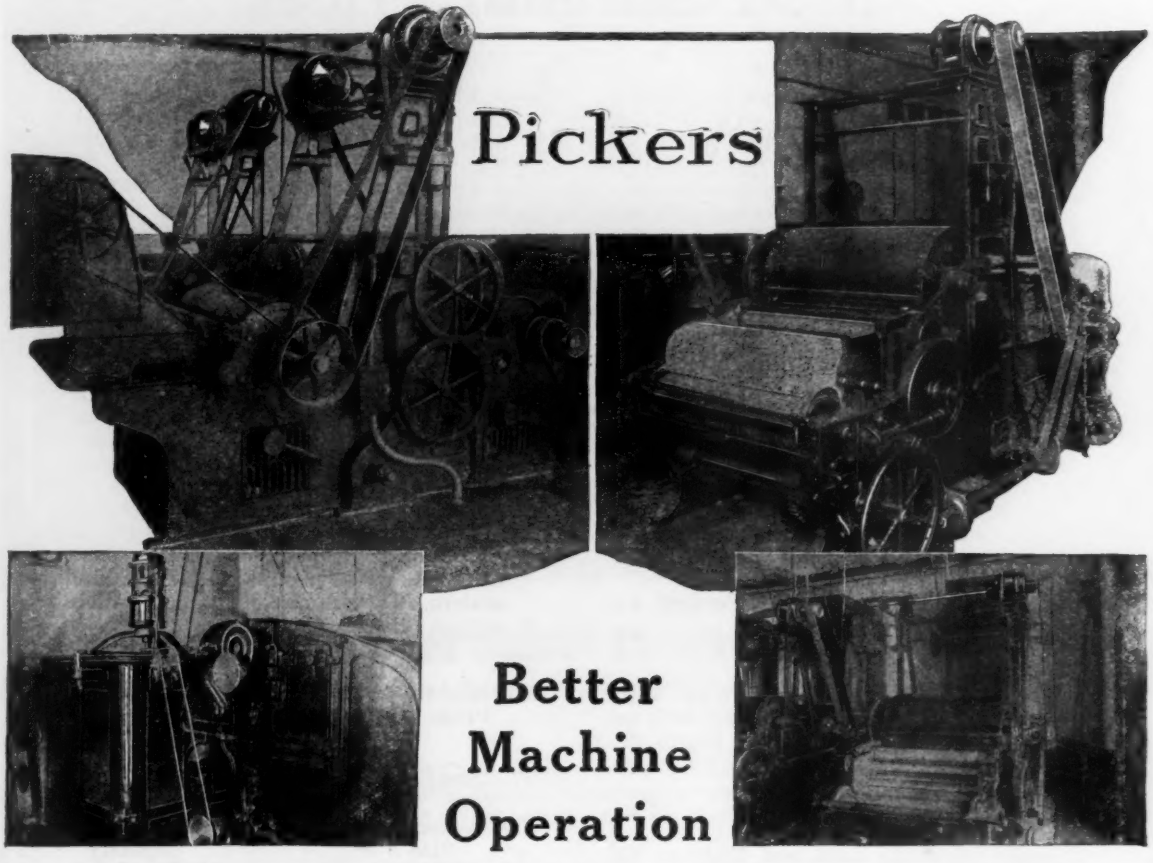
Hyatt Roller Bearing Company

Newark, N. J.

Pacific Coast Address: Hyatt Roller Bearing Company, San Francisco, Cal.

Cotton

Use Individual Motor Drive



In the Picker Room individual motor drive produces economies by providing flexibility of operation, eliminating shafting load, and reducing the number of belts to a minimum.

G-E textile motors are specially designed for this service—are furnished with screened bearing heads; waste-packed, dust-tight bearings; and conduit terminal boxes. The insulation of the windings is moisture resisting, to avoid injury to motors from operation of sprinkler system in case of fire.

These motors are also designed for different methods of drive—with single shaft extension and one pulley for single beater pickers; single shaft extension and two pulleys for 2-beater pickers; and double shaft extension with two pulleys and three bearings where the drive comes on opposite sides of the machine.

Vertical openers may be driven by direct-connected vertical motors when the machine speeds will permit.

G-E Picker Motors are available in sizes from 3-h.p. to 15-h.p., and have various speeds to suit the machinery speeds. Suitable G-E Controllers can also be furnished for any motor application.

General Electric Company

General Office Schenectady, N.Y.

Sales Offices in all large cities

44-47

Textile Mill Equipment

All At Bargain Prices

Cotton Dryers

25—Sargent No. 24 six section 8 foot Cotton Dryers. Overall dimensions 99′4″ long, 15′5″ wide, 7′10″ high. Equipped with Model "M" Self feeder. Hot air drawn through belt by 33″ exhaust fans. Constructed throughout of metal angles and plates.

Mixing Pickers

25—Sargent Cylindrical type 48″ Mixing Pickers. Equipped with single pair fluted feed rolls, 3½″ diameter. Cylinder provided with 6 heavy steel bars on lugs bolted to spider. Capacity 600 to 800 lbs. per hour.

Cotton Washers

25—Sargent 48″ Special Cotton Washers or Rinsers. Complete with cast iron frame, pans, squeeze rolls, kicker and conveyor.

Feeders

25—Sargent 48″ Model "M" Feeders for Sargent Dryers.

Concentrators

8—Noble and Wood Concentrators right and left hand cylinder washers with octagon cylinder diameter 44″, length 42″. Rotates at 6 R.P.M. Vat is 1′4½″ wide, 6′9″ long, 2′9″ high.

Wringers

65—42″ American Tool and Machine Co. Centrifugal Wringers. Complete with 42″ perforated steel basket shell, with steel top, basket 22½″ inside depth, ⅜″ steel Wringer direct connected to 40 H.P. Motor.

18—Sets 36″ American Tool and Machine Co. Belt Driven Centrifugal Wringers. Each set arranged in batteries of three.

Digesters

40—Welded Steel Digesters. Capacity 1300 cu. ft. Inside diameter 8′, length overall 27′. Complete with cast iron supporting ring, false bottom, hoppers, guides and all accessories.

823 H.P. Boilers

36—823-H.P. Stirling Boilers. Class M-30, complete with all accessories. Babcock & Wilcox Co., New York, makers. 200 lbs. pressure, 630 3½-in. tubes, No. 10 gauge, 150 of these tubes are circulators. Steam drums, double riveted, double strap butt joint, 1-in. rivets. Thickness shell plate and tube ends in steam drums ⅞ in. mud drum 1 in. Space occupied by boiler 18 ft. by 22 ft. 3 in. by 29 ft. 9 in. high. Complete with all accessories.

350 H.P. Engines

18—Corliss Engines. Maker Allis-Chalmers Co. 350 H.P. 18 in. x 36 in. double eccentric, semi-high speed, 125 R.P.M., simple Corliss belted type, designed to operate on 140 lbs. steam pressure with 1½ lbs. back pressure. Double eccentric allows cut off up to 75 per cent of stroke. Flywheel 11 ft. diameter by 32-in. face. Complete with Phoenix individual oiling system. Type R, size 30, made by Richardson-Phoenix Co.

Motors

225—Slightly used Motors 7½-75 H.P. 3 Phase 60 Cycle, 440 Volt.

Tanks

1000—Steel Tanks, 100-55,000 gallon capacity.

350—Wood Tanks, New and Used

Size	Capacity
12′6″ x 11′	10150 gal.
12′6″ x 18′	16600 gal.

Send for Bulletin No. 7.

Scales

500—Howe and Fairbanks Scales. Capacities 600 lbs. to 100 tons. Guaranteed to be in good condition.

Transmission

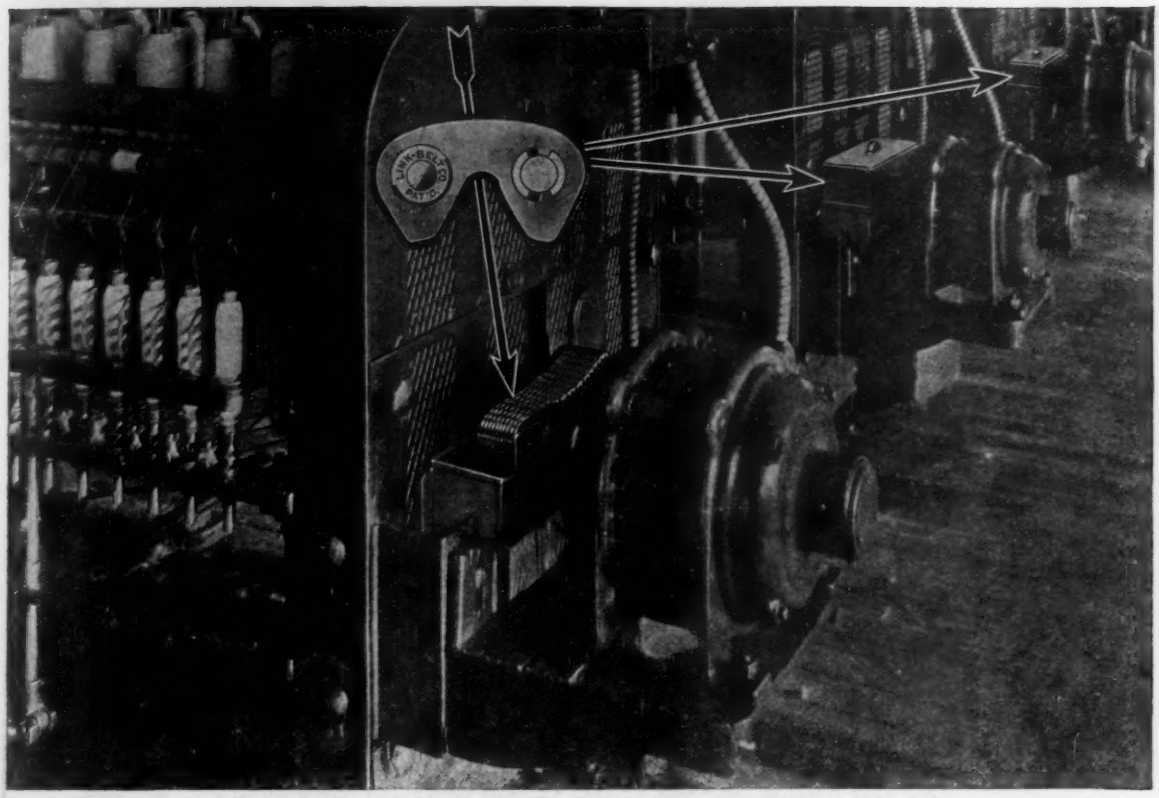
Pulleys	Shafting
Pillow Blocks	Drop Hangers
Bearings	Couplings
Floor Brackets	Floor Stands
Friction Clutches	Collars

Write for Bulletin No. 15.

Let us submit our quotations and save you money

NASHVILLE INDUSTRIAL CORPORATION

JACKSONVILLE, TENNESSEE



Increases our production 6%

(Thomas W. Sizemore, Supt., American Spinning Co., Greenville, S. C.)

Further:

"The installation of Link-Belt Silent Chain Drives on our spinning frames has eliminated the slip of belts, thereby increasing our production 6% and saving us $4,006.64 a year. At this rate the chains repay their cost every year.

"The individual drive enables us to get rid of belts. So we purchased 184 Link-Belt Silent Chains for driving our spinning frames. 93 are 5 H. P. chains and 91 are 7½ H. P. We were one of the first mills to use Link-Belt Silent Chains for this purpose.

"It is conservative to estimate that our production has been increased 6% due to the elimination of belt slippage."

Link-Belt Silent Chain Data Book No. 125 is a handbook of silent chain practice—not a catalog. It shows how to figure drives and determine prices. Send for it. Return the coupon.

LINK-BELT COMPANY
910 S. MICHIGAN AVENUE, CHICAGO

Please send postpaid—Link-Belt Silent Chain Data Book No. 125.

Name _____

Firm _____

Street _____

Town _____

State _____

1262

LINK-BELT COMPANY

PHILADELPHIA		CHICAGO		INDIANAPOLIS	
New York	Woolworth Bldg.	Cleveland	429 Kirby Bldg.	Denver	Lindrooth, Shubart & Co., Boston Bldg.
Boston 9	49 Federal St.	Detroit	4219 Woodward Ave.	Louisville, Ky.	Frederick Wehle, 321 Starks Bldg.
Pittsburgh	336 Fifth Ave.	Kansas City, Mo.	306 Kimbarct Bldg.	New Orleans	C. O. Hinz, 504 Carondelet Bldg.
St. Louis	Central Nat'l Bank Bldg.	Seattle	620 First Ave., S.	Birmingham, Ala.	E. L. Morrow, 720 Brown-Marx Bldg.
Buffalo	745 Ellicott Square	Portland, Ore.	101 First St.	Charlotte, N. C.	J. S. Cothran, Com'l Bank Bldg.
Wilkes-Barre	2d Nat'l Bank Bldg.	San Francisco	168 Second St.	Canadian Link-Belt Co., Ltd.	
Huntington, W. Va.	Robson-Pritchard Bldg	Los Angeles	103 N. Los Angeles St.		Toronto and Montreal

H. W. CALDWELL & SON CO., CHICAGO — NEW YORK, Woolworth Bldg. — DALLAS, TEXAS, 709 Main St.

LINK-BELT
SILENT CHAIN DRIVES

Suppose you were to change your position tomorrow

And suppose you went into an entirely different industry and had to meet entirely new mechanical conditions—had to operate different types of power units, had to maintain new types of machines. You'd have a new set of mechanical problems to work out.

But there is one problem that need not worry you in the least—an important one, too.

And that is the question of the kind and amount of lubricants to use.

You—and the next man—have only to call on The Texas Company, tell us what you have to lubricate, and we'll supply you with the right oils—promptly.

We can do it—because we are doing it. We are doing it in every industry, on every kind of machine under every conceivable working condition.

We have the *lubricants*

And we have the *men* who understand their application

If you have any lubricating problem, new or old, which you want solved once and for all, give us the opportunity to "Demonstrate."

When you see the way we go about things you, who are responsible for maintenance, will know that Texaco Lubricants and Texaco Service are your Allies in your fight against waste of power and unwarranted consumption of lubricants.

Texaco Lubricants will be promptly delivered from one of our 700 warehouses all over the country and Texaco Service can be readily secured by calling on our nearest district office.

TEXACO

The Correct Lubricants and Lubricating Service

One Thing More

And that is to give you the opportunity of getting our Magazine "Lubrication." This Magazine, published by The Texas Company, contains technical, authoritative articles covering the use of lubricants in many industries. Anyone, whose business or profession guarantees his sustained interest in this important branch of engineering practice, may receive it. Thus the present list includes: Engineers, mechanical executives, purchasing agents, technical libraries, universities—and YOU when you reach for your pen or pencil and do the necessary.

THE TEXAS COMPANY, U. S. A.

Texaco Petroleum Products

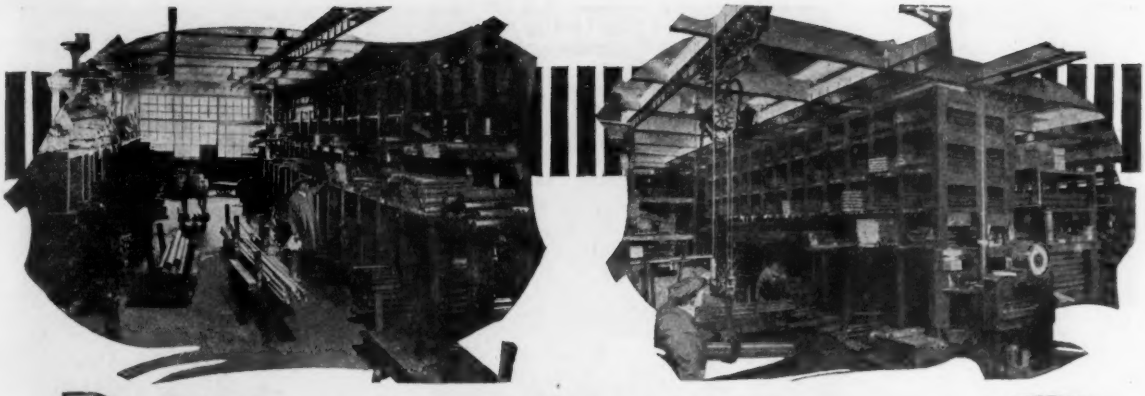
Dept. O, 17 Battery Place, New York City

Kindly put me on the mailing list to receive your magazine "LUBRICATION."

Name ---------- *Street* ----------

City ---------- *State* ----------

6-23



Factors in Strom BALL BEARINGS Supremacy

No. 2—The Raw Stock Room

Here is the impregnable foundation of the perfect performance of STROM ball bearings. STROM bearing steel—made to our own specifications, by America's most expert steel workers, yet subjected to searching chemical and physical tests before use—has that unvarying and exact texture which alone could withstand the untiring watchfulness and machine precision of STROM ball bearing production. Such raw material—plus constructive testing and analyzing continued from bar-stock to shipping-box—is an important factor in determining STROM supremacy.

STROM guaranteed ball bearings, on *new* or *replacement* work, reduce friction to the vanishing point—

"Wherever a Shaft Turns"

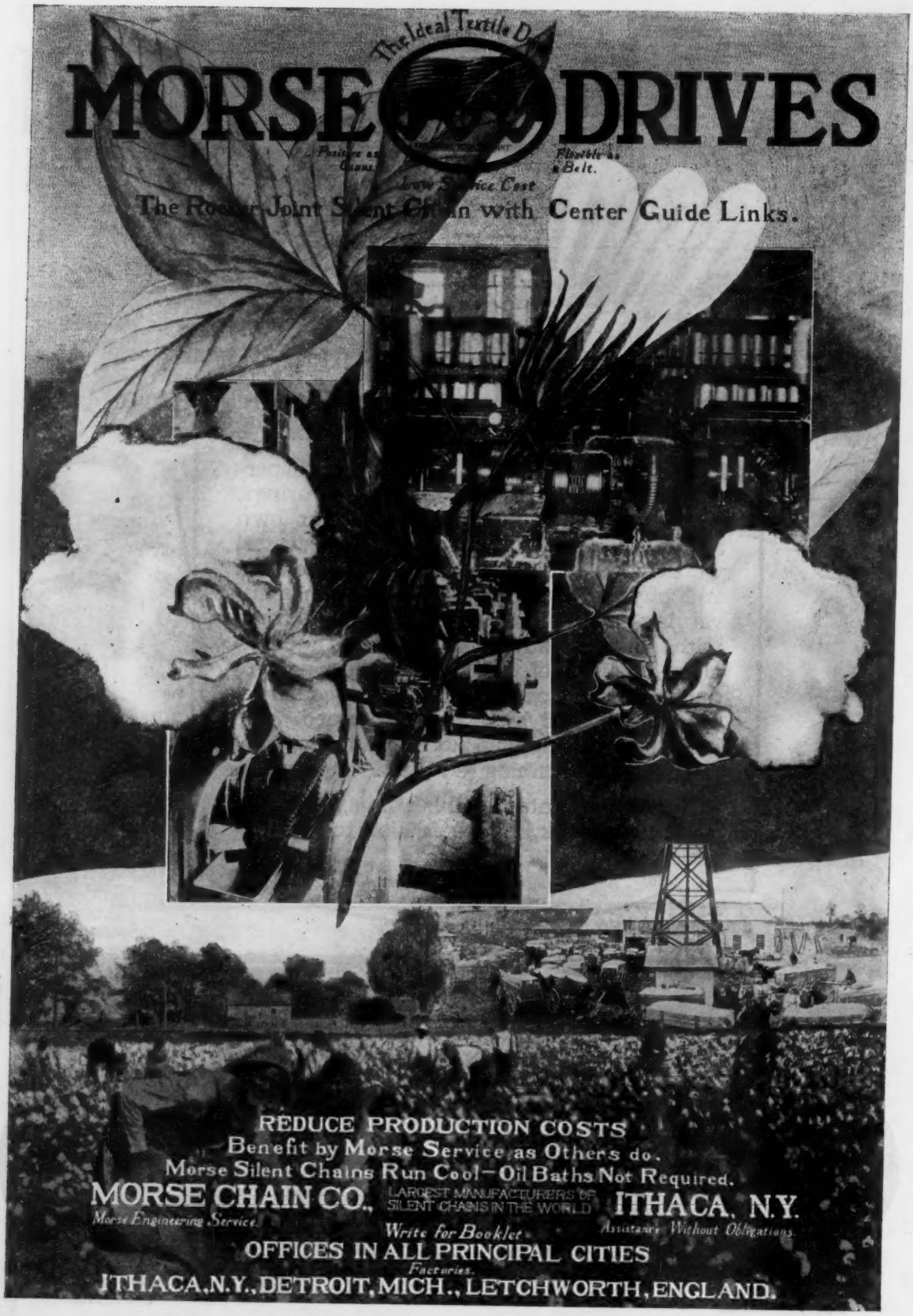
(1976)

Strom BALL BEARINGS

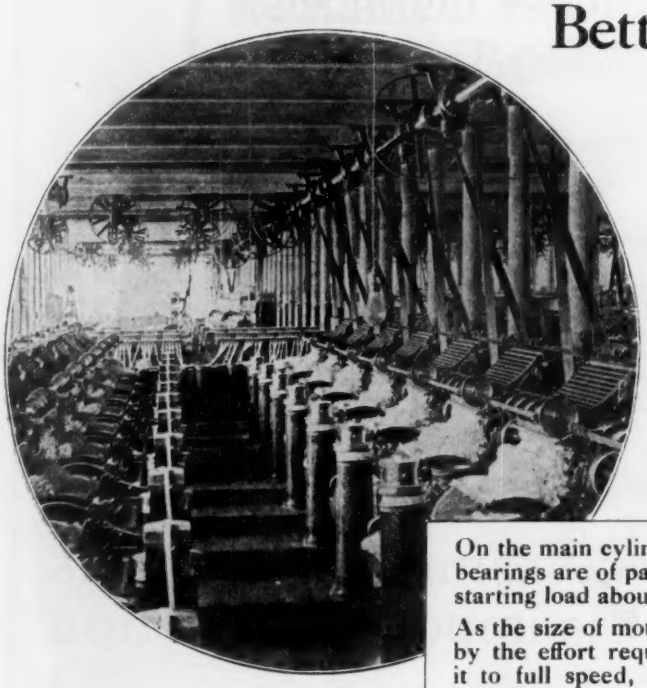
U. S. Ball Bearing Mfg. Co.
(Conrad Patent Licensee)
4544 Palmer St., Chicago, Ill.

An Organization Built for Precision

Scientific in Principle and Practice


The Ideal Textile D
MORSE DRIVES
Positive as Gears.
Flexible as a Belt.
Low Service Cost
The Roller-Joint Silent Chain with Center Guide Links.
REDUCE PRODUCTION COSTS
Benefit by Morse Service as Others do.
Morse Silent Chains Run Cool—Oil Baths Not Required.
MORSE CHAIN CO.,
LARGEST MANUFACTURERS OF SILENT CHAINS IN THE WORLD
ITHACA, N.Y.
Morse Engineering Service.
Assistance Without Obligations.
Write for Booklet
OFFICES IN ALL PRINCIPAL CITIES
Factories.
ITHACA, N.Y., DETROIT, MICH., LETCHWORTH, ENGLAND.

Better Cotton Carding At Lower Cost



On the main cylinder and licker in of cotton cards, Hyatt bearings are of particular advantage because they lessen the starting load about 25%.

As the size of motor to drive a card is determined entirely by the effort required to start the card and to accelerate it to full speed, the use of Hyatt roller bearings makes possible smaller motors, smaller controlling devices, lighter wiring connections and of course results in a continuous saving of power.

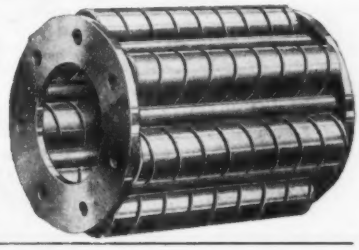
If these reductions in size of motor and amount of power were the only advantages of Hyatt bearings for cards they would be well worthwhile. In addition however, these bearings improve card operation by maintaining close limits between the cylinder and flat clothing for years without bearing adjustment or replacement. The bearings require lubrication only three to four times a year and do not leak lubricant to stain the cotton or spoil the card clothing.

You will find it a good investment therefore to specify Hyatt bearings for your new cards (cost about 2% extra) and to have Hyatt bearing replacement boxes applied to your present cards at about 4% of the cost of the card. Write to us for complete information.

HYATT ROLLER BEARING COMPANY

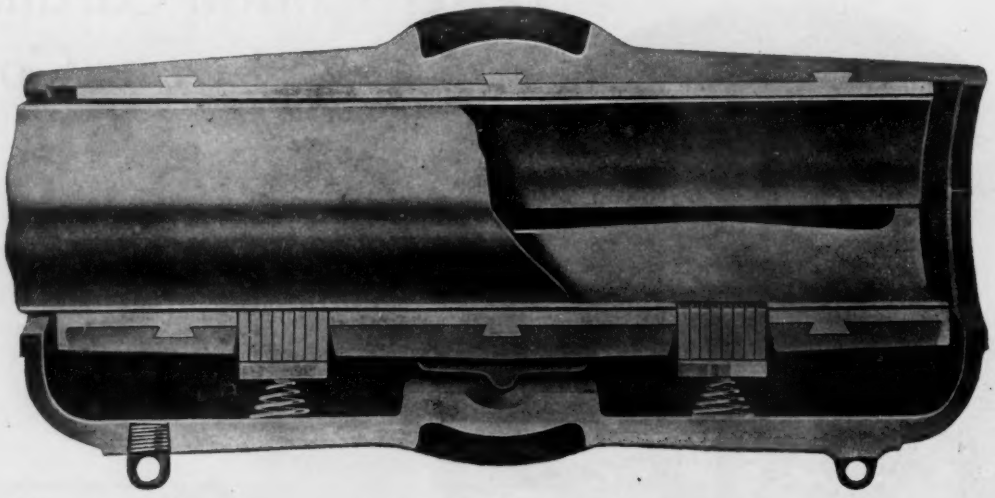
Newark Detroit Chicago San Francisco

Worcester Milwaukee Huntington Minneapolis Philadelphia Cleveland Pittsburgh Buffalo Indianapolis



Use Hyatt Bearings On Your Line Shafting
See Bulletin No. 127

Lubrication as positive
as the flow of sap in the spring



What about your investment ten years from now? That is the important question

When we say that a Dodge capillary bearing will be in every respect as efficient and economical after ten years' service as when first installed we are backed by actual performance records under average operating conditions.

Laboratory tests are not made under average conditions—they offer no guarantee of future efficiency—they give no warning of broken parts, scored shafts and expensive replacements.

What you want is a time tested bearing—you want your investment protected for many years. Performance of the past is a safe guarantee of the future.

The Dodge Capillary bearing combines proper bearing area, positive lubricating means and good babbitt, the three vital requisites of an efficient bearing.

Lubrication by capillary attraction is positive and unfailing. An absolutely uniform and unbroken film of clean lubricant is constantly maintained between shaft and liner. There are no moving parts in the capillary bearing—hence no churning of the oil—dirt settles to the bottom, where it belongs, and stays there.

An installation of Dodge capillary bearings represents a moderate first cost—insures low upkeep and substantial dividends in power savings. Buy them from your local Dodge dealer on the immediate delivery basis.

Read what these users say —

After 21 years service—

"Our experience leads us to believe that Dodge Capillary bearings are the most dependable of all types for continuous service."

Running at 2300 R. P. M. for ten years—

"This line shaft (2300 R. P. M.) has been operating for ten years and during that time we have not had *any* trouble."

Ten years service—never a hot bearing—

"We are glad to state that your capillary bearings continue to give satisfaction. We have never had a hot bearing where they have been used."

Another ten year user—

"Have been using Capillary bearings for ten years and have the first complaint to make."

"None better on the market"

"Your capillary bearings are giving us very satisfactory service—we believe there are none better on the market."

Names on request

DODGE

Capillary Bearings

Dodge Manufacturing Corporation

General Office:: Mishawaka, Indiana Works: Mishawaka, Indiana, and Oneida, N. Y.

New York Philadelphia Pittsburgh Boston Cincinnati Newark Chicago
Atlanta Minneapolis St. Louis Houston Seattle San Francisco

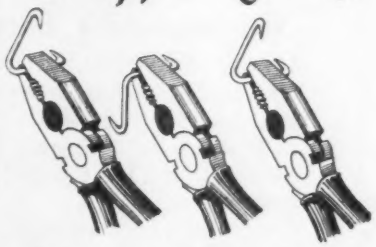
The Mechanical Accuracy of Clipper Belt Lacing assures a flawlessly Laced belt

STANDARD EQUIPMENT
THE WORLD OVER

Anyone can lace a belt with the

Clipper

The Plier Test of Clipper Quality



Take a pair of pliers and bend a Clipper hook back and forth. Note its toughness and fatigue resisting quality. How it bends and bends without breaking.

And yet, notice the "feel" of stiffness and strength. The quality of the Clipper hook coupled with the mechanical accuracy of the Clipper joint, have made the Clipper Belt Lacer standard equipment the world over.

Clipper Belt Hooks are carded 37 hooks to a card (enough for a six-inch belt) and packed 27 cards to a box with 14 Clipper Twisted Raw hide pins. This is enough to lace both ends of 80 inches of belting width.

Clipper Belt Lacer Company

Grand Rapids, Mich.

CLIPPER BELT LACER CO.
GRAND RAPIDS, MICH.

- ☐ Please send Clipper Belt Lacer on 30 days trial.
- ☐ Please have salesman call and demonstrate Clipper Belt Lacer.
- ☐ Please send full information regarding Clipper Belt Lacer.

Name .....

Address .....

Beam Bleaching and Dyeing

(Brandwood's Patents)

Up to twelve Beams, or three thousand pounds and up to fifteen hundred pounds of CHEESES bleached or dyed, Indigo, Vat, Naphthol, Sulphur and Direct Colors ***at one operation.***

Cost in labor and materials guaranteed less than by any other System.

We give definite guarantees in our Contracts as to cost of labor and materials and quality of work.

Users of our Bleaching and Dyeing Plants have the exclusive free benefit of Twenty United States Patents, giving great advantages in Warping, Bleaching, Dyeing, Drying, Quilling and Splitting, and not available by any other System.

We further give the use of valuable secret processes, and many years' practical experience. We start up the Plants free, and give free service at all times.

Reckoned on basis of production, our Plants are cheapest in first cost.

We are prepared to install Plants and take payment, as and when saved by their use.

Most of the Chambrays and stripes now manufactured in the U. S. and Canada, are bleached and dyed on our Plants.

Exclusive Patent Rights are still available for some States and Territories.

Raw Stock Bleaching and Dyeing

(Brandwood's Patents)

Bleaching or Dyeing continuously in One Apparatus up to fifteen hundred pounds per hour, Indigo, Vat, Naphtol, Basic Developed, Sulphur and Direct Colors.

Cost in Labor and Materials guaranteed less than by any other system.

Dyehouse labor in handling the cotton before and after dyeing, and hydro-extracting is eliminated.

Three-fourths of the labor costs and three-fourths of the dyehouse floor space is saved.

Spinning production considerably increased.

No shortening, weakening or matting of the cotton.

Colors brighter and evenly dyed.

We give definite guarantees in our Contracts as to cost of labor and materials and quality of work.

We start up the Plants free and give free service at all times.

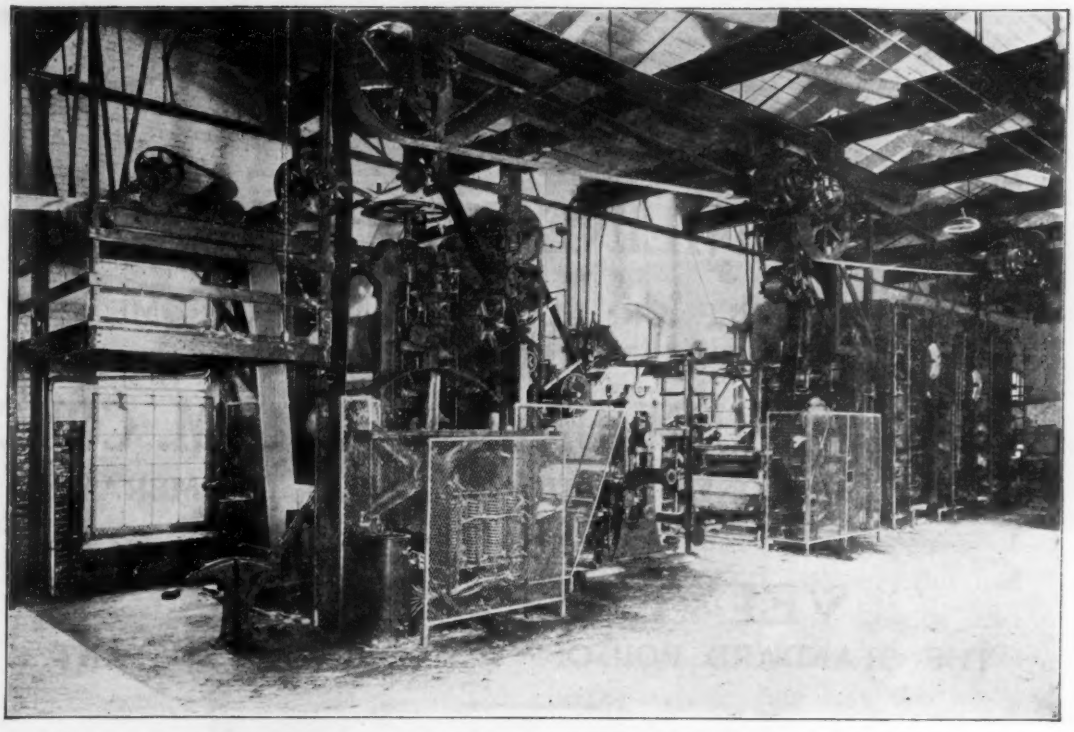
Exclusive Patent Rights are being granted to Colored Goods Manufacturers for their own State or Territory.

For full particulars apply to

JOHN BRANDWOOD

ELTON COP DYEING CO., LTD.

BURY, ENGLAND



FINISHING MACHINERY IN RANGE

The greatest single factor in lowering production costs

Washing, soaping, tentering, drying, starching, cooling, calendering and winding—these operations are among many which lend themselves to range finishing.

Three men only are required to operate such a range.

Ordinarily twelve men would be required if these machines were operated singly.

Then there is the advantage of continuous production, more uniform products and a saving in seconds by elimination of stop and start waste.

Finishing Machinery in Range is particularly adaptable to cotton goods in the piece—bag cloth, print cloth, chambreys, ginghams, heavy lawns, sheetings, shade cloth and other generally recognized lines.

No matter how many finishing operations your product requires, get in touch with us about putting your machines in range; the saving is often 33⅓ per cent in finishing costs.

H. W. BUTTERWORTH & SONS CO.
Established 1820
PHILADELPHIA, PA.

SOUTHERN REPRESENTATIVE
Milton G. Smith, Greenville S. C.

Canadian Representative
W. J. Westaway Co.
Hamilton, Ontario, Canada

Providence Office
Turk's Head
Building

BUTTERWORTH *Finishing* MACHINERY

UCPC

ANILINE COLORS

DIRECT, SULPHUR, ACID, BASIC AND CHROME
including the following new Product

BRILLIANT SULPHUR BLUE T. C. M. CONC.

THE BEST MONEY VALUE BLUE FOR CHAMBRAYS

VELVETEEN PASTE

THE STANDARD BOIL-OFF & DYE BATH ASSISTANT

U. C. TALLOW

THE HIGHEST GRADE OF PURE SIZING TALLOW

KING BRAND SIZING

OUR "K.B." IS A COMPLETE SIZE IN ITSELF. HIGH IN TALLOW

WAX SOFTENER

A SCIENTIFICALLY BLENDED SOFTENER FOR BLEACHED GOODS

UNITED CHEMICAL PRODUCTS CORPORATION

York and Colgate Sts. . . . . Jersey City, N. J.

Southern Office, Commercial National Bank Bldg., Charlotte, N. C.

REPRESENTATIVES: R. T. GRANT, Charlotte, N. C.
GEO. W. WATSON, Hazlehurst, Miss.
C. D. MAIGATTER, Charlotte, N. C.

FLETCHER

DEPENDABLE

EXTRACTORS

Vertical Motor Driven Extractor

The good name held by Fletcher Extractors in the textile field is not the result of isolated cases of satisfactory performance, but has been earned by the year-in and year-out dependability of **every** extractor which has left the shop during the past fifty years.

The latest types of Fletcher Extractors retain the simplicity, ruggedness, and durability for which their predecessors are famous, and in addition embody all the latest improvements which decrease running costs and aid production.

You should know more about these modern extractors. Write for complete information.

Other types are electric underdriven, belt driven, and steam turbine driven.

FLETCHER WORKS

(Formerly Schaum & Uhlinger)

Glenwood Avenue and Second Street

PHILADELPHIA, U. S. A.

Southern Representative: W. A. Kennedy, Charlotte, N. C.

Starch

The experience of critical operators has shown this popular brand to be the most efficient sizing agent, both for additional WEIGHT and increased STRENGTH of WARP. Penetration accomplishes these important results.

EAGLE STARCH is especially manufactured to cover a wide range of fluidities to meet the needs of all classes of weaves.

EAGLE STARCH penetrates.

Corn Products Refining Company

New York

Southern Office *Greenville, S. C.*

Starch

MATHIESON Chemicals

Safe Buying on Spot

FOR your convenience and protection, less-than-carload lots of our own stocks of "Eagle Thistle" products are supplied to you ex-warehouse by our own distributors in all principal cities of the country. You deal with us just as though shipment were made direct from our works.

Our less-than-carload prices are based on general market conditions, not on local supply and demand. We determine the prices of Mathieson products and publish them openly on definite schedules.

Eliminate price and delivery uncertainties by specifying Mathieson Chemicals.

The MATHIESON ALKALI WORKS Inc.
25 WEST 43rd STREET NEW YORK CITY

PHILADELPHIA
PROVIDENCE

CHICAGO
CHARLOTTE

Deal Direct with the Manufacturer

Bicarbonate of Soda
Liquid Chlorine-Caustic Soda
Sesquicarbonate of Soda
Bleaching Powder-Soda Ash

Hydroxy Art Silk Coning Oil

A Specially Prepared Oil

Used in the Coning, Winding, and Knitting of Artificial Silk.

Makes Artificial Silk Knit Smoothly.
Eliminates Breakdowns. Reduces Seconds.
Washes out easily at low temperature.

Therefore—
Dyeing and Bleaching is even and shades brighter.

Sample sent on request—no charge.

Developene (There Is no Just as Good)

Makes a rusty Black stocking turn deep Black.

Kali Chlorine Neutralizer

An anti-chlor—prevents tender bleached goods.

All chemicals for the Dye House—
All oils—Sulphonated—Turkey Red—
Neatsfoot, Olive, etc.

KALI MANUFACTURING CO.

1410 No. Front St., Philadelphia, Pa.

Sole Manufacturers of "Hydroxy Oils" Patented.

CERTAINTY

There is that about

"HAWK THIN BOILING STARCH"

which satisfies its users that they have the highest quality obtainable in a warp sizing starch.

Added to this certainty is the assurance that future deliveries will be exactly the same—that the viscosity will be uniform.

The unsolicited enconiums which so often follow trial runs, bear a healthy testimony to the manner in which progressive mills receive HAWK THIN BOILING STARCH.

Supplying the Textile Industry also with

SAGO FLOUR
GUMS AND DEXTRINES
"BEST" WHEAT STARCH
"ROYAL" TAPIOCA FLOUR
"GOLD MEDAL" REFINED STARCH
"SILVER MEDAL" PEARL STARCH
"R. A." HOLLAND POTATO STARCH
"SOLUBLE WHEAT STARCH BINDER"
ADAPTED TO EVERY TEXTILE REQUIREMENT

STEIN, HALL & CO., INC.
61 BROADWAY
NEW YORK

SOUTHERN OFFICE:
CHARLOTTE, N. C.

BRANCHES:
PHILADELPHIA BOSTON PROVIDENCE
CHICAGO TROY

QUALITY AND SERVICE SINCE 1866.

WHAT WILL THE
DYE DO ?

Fashion's Colors . . .
and the Dyer's Formulas

THE colors of fashion for the coming season have just been announced in the 1923 Fall Season Shade Card of the Textile Color Card Association.

Dyer's Formulas—the "National" booklet of formulas matching these new Fall Colors, is complete—available to textile dyers immediately following the release of the Season's Shade Card. It contains formulas carefully developed and tested to match the new fall colors.

Write to the nearest "National" Branch Office for your copy of Dyer's Formulas for the 1923 Fall Season.

National Aniline and Chemical Co., Inc.
40 Rector Street, New York, N.Y.

Boston	*Philadelphia*	*San Francisco*
Providence	*Charlotte*	*Toronto*
Hartford	*Chicago*	*Montreal*

"NATIONAL" DYES
FOR TEXTILES

NATIONAL U.S.A. DYES

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor. **R. W. PHILIP, Associate Editor.**

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 per year; Canada, $1.50 a year; Foreign, $2.00 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The name of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

Volume 87 **Member Associated Business Papers, Inc.** **Member Audit Bureau of Circulation.** **Number 8**

CONTENTS

EDITORIAL—

The Woeful Failure of the Politicians 623
The World Court 624
S.. T. A. Meeting This Month 624

GENERAL AND TECHNICAL—

A Stabilized Stabilizer 625
American Cotton Manufacturers' Association Convenes at Richmond 627
Transportation—A Part of Production 631
Address by Two Governors 636
Georgia Manufacturers' Association 643
Cotton Mill Men Meet at Providence 647
Some Experiments in Four-Roll Drafting Applied to Slubbing and Roving Frames 648
Cotton Fibers from a Layman's Viewpoint 652
President Amory's Address 656
Brazil—The Promising Land 657
The Effect of Moisture in Cotton On the Efficiency of the Opening Process 659
Finishing Cotton Bag Goods 661
What the Southern Mills are Doing 662
The New England Mill Situation 664
Cotton Comment 666
Notes About Men You Know 670
Intangibles in Manufacturing 673
An Old-Timer Says— 675

HOW OTHER MEN MANAGE—

The Angle of Yarns 677
Card Chains and Gear Speeds 679
Uneven Laps 681
Some New Devices 683
Why One Man Lost His Job 685
Turning Spinning Rings 687
Balanced Twist 687
What Causes This Waste Trouble? 689
That Clearer Waste Trouble 689
A New Differential Device 691
An Experience in Uneven Laps 693
Study Teamwork 694
Twist on Spinning Frames 697
Where is the Best Place to Size Roving? 697
A Remedy for Lumpy Roving at the Slubber 699
An Explanation 703
Export Classifications of Cotton Duck 704
That Lumpy Roving 704

KNITTING SECTION—

Knit Underwear Men Meet at Atlantic City 707
Among the Knitting Mills 713
The Yarn Market 714
The Knit Goods Market 717

Back of every productive mill you'll always find perfect cooling and heating

ATMOSPHERIC conditions play an important part in the efficiency and productiveness of every department of the mill. Back of every highly efficient mill you'll find perfect ventilation—perfect cooling in the summer and heating in the winter. And back of every perfect cooling and heating system you'll find the most perfect fans and blowers—BUCKEYE.

In the Buckeye equipped mill you won't find a hot, oppressive atmosphere in the summer that stifles the employee's efficiency and cuts your production—you won't find a cold, numbing condition in winter that keeps them full of cold. You won't find the dye house filled with vapor that is injurious alike to employee, product and building interior. You'll find the correct temperature maintained the year around—maintained by a system exactly suited to your particular requirements—a system using the famous

BUCKEYE FANS and BLOWERS

for Cooling—Ventilating—Heating

Our engineers are at your service. You will be under no obligation by writing us for any information you desire or asking that an engineer call and investigate your particular conditions and advise with you as to the best equipment or system for your mill—whether it be a system of cooling, heating, ventilating, exhausting, condensation and vapor elimination, conveying of raw stock, lint, etc., or the drying of cloth.

We are glad to serve you, whether you buy or not. Write us direct or write or wire our Southern office.

BUCKEYE BLOWER CO.

COLUMBUS, OHIO

Southern District Office, 372 Whitehall St., Atlanta, Ga.

324 Monadnock Block, Chicago, Ill. 1400 Broadway, New York
101 Wabash Bldg., Pittsburgh, Pa.

With the Publishers—

Black Snow.

If you have ever taken an early morning walk in the residential section of a soft coal burning city you of course have noticed the limited visibility produced by the smoky atmosphere, and also, as you walked along, you have seen an occasional chimney from the top of which issued numbers of small feathery particles of soot that floated down in an uncertain and indeterminate way, following the vagaries of disturbing air currents until the attraction of gravity brought them to a final resting place.

Perhaps you have seen one of these sooty particles apparently seek a landing place on some portion of your anatomy and, if successful, have endeavored to wipe the trespasser away with your handkerchief only to discover that you had produced a smudge still more difficult to remove.

This set of conditions, if you will allow the simile, is analogous to the advertising pages in a business paper when you are not directly looking for something you wish to purchase but are absorbing informative material from the reading pages. You are mentally aware of the advertisements as you pass them, even though you are engrossed in what you are reading. Then some particular piece of display copy meets your eye and in spite of your endeavor to maintain in the mental foreground the continuity of the article you are reading, that piece of copy has made its mark upon your memory records, just as plainly and just as certainly as the speck of soot made its mark in the form of a smudge upon that part of your anatomy from which you attempted to wipe it—in fact the mental mark is the more permanent, as any decided effort to erase it only implants its roots more deeply.

A concrete illustration of how display copy sells an unsuspected customer is shown in the case of a representative of a business paper publisher who was looking over a competitive publication to see who advertised therein. As his eyes roved from page to page his attention was caught by a small cut in one corner of a page display labeled "steam water heater." This made no particular impression at the time, but, like the smudge of soot, it remained with him, and a little later it occurred to him that such a device, if applicable, was just what he needed in his residence. Thereupon he again looked up the advertisement and wrote to the Pennsylvania manufacturer of the device for a catalog and prices. In less than six months the equipment was purchased and installed, thus completing the cycle by providing a customer that almost any advertiser will admit was about as unexpected a prospect as could possibly be imagined.

It is therefore evident that you cannot always pick and choose, from among the variety of subjects offered to you in your business paper, only those titles or articles which you, at the moment, believe to be of most interest. You unconsciously absorb suggestions and facts as you go along and call them forth from your memory tablets later, without apparent effort, when an occasion arises where your experience tells you they may prove useful.

Like the specks of soot from the chimney, where they hit, they stick.

AMONG COTTON'S READERS

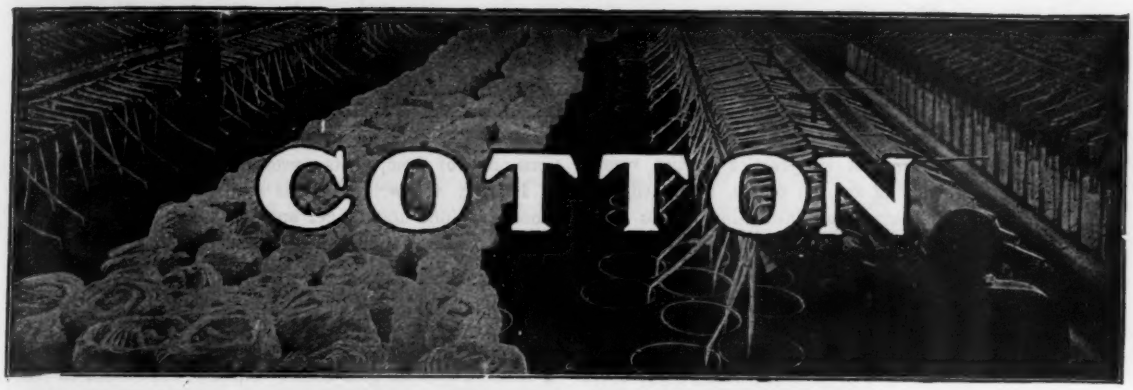
George S. Brown, Superintendent,

Ashland Cotton Company,

Jewett City, Conn.

"I wish to say here that my opinion of COTTON is extremely high. In fact, I feel that of all the textile papers, it has a very safe lead"

Geo. S. Brown



June, Nineteen-Twenty-Three

The Woeful Failure of the Politicians.

In nothing was the World War so singular as in its failure to evolve new or truly great figures. Outside of Russia, names conspicious at the beginning of the conflagration headed the lists of notables who had to do with it at the ending. Many reputations were lost but scarcely a single new one, martial, political or otherwise, was made by it, and only a few were enhanced. No "Little Corporal" rose from the bottom to the heights of acclaim in the field. No Grant who, a failure and unknown, entered the conflict in inconspicuous place to come out of it an immortal. No Lincoln's renown was earned by anyone having to do with the polities of the conflict.

And this fact of the war proper still adheres to the war's aftermath. Probably with the exception alone of Mussolini not a single new figure has been drawn from the inconspicuous realms of politics by the demand for power and genius to grapple with the tremendous problems which the war's ending left on the hands of the world's people.

Politicians rarely figure big while war is on. Their great opportunity comes when war ends and leaves gaping wounds to be healed, wide chasms to be bridged, vast restoration and upbuilding to be attended to. Generally in the past statesmanship has risen measurably well to these tasks. One of the most glorious epochs in English political history followed the Napoleonic wars, as happened in our case following the Revolutionary War. Though Lincoln's untimely death brought about a state of confusion which caused our national history immediately following the Civil War to be inglorious in the extreme, American statesmanship ultimately and with fair promptness rose to the trying demands upon it following our conflict of sixty years ago. The South, bled white though it was, produced a post-bellum statesmanship that in many ways showed a people's resourcefulness for commanding needed leadership in times of dire stress.

Since the World War such a circumstance hasn't occurred in this or any country. Those still high in political command are thought of, and accurately, more in the terms of politicians than of statesmen, just as was the case when the war began and throughout its course. Old leaders have been replaced in some measure by new ones, but without any great improvement in quality. Though they have had the greatest opportunity time ever afforded mortal man for the display of genius, courage, inherent individual power, the politicians in virtually all countries have fallen down. And in this country no less so than in others.

This statement is proven by the fact, among many others, that the best post-war statesmanship, notably in this country, has been displayed in opposition. No little genius has been expended in showing up the fallacies in the proposals of persons in high power and in combatting, usually with success, those proposals. But that genius has been unable so far to put forward, successfully, programs to take the place of those it has destroyed or impeded. Hence virtually all of the true reconstruction that has taken place —and considerable undoubtedly has been done—has been in spite of rather than with the assistance of those in political power and influence. Statesmanship, for example, has shown utter impotency in dealing with world finances, especially as expressed in currencies. Yet, in the face of financial confusion and demoralized currencies, business has gone ahead and now moves at a rate that is astounding.

Compromise, passing expediency, smallness and selfishness of viewpoint has dominated the approach made by most of the world's dominant politicians towards virtually every big problem of the day.

Even in our country today when everybody agrees that, for our own benefit if nothing more, we should help Europe progress out of the chaos of the war's aftermath, there isn't a single statesman in the land who seems able to tell us how to do it. Plenty of them can tell us very ably how not to do it.

This is a very bad and can be a dangerous state of affairs. One disheartening offshoot from it is an accelerated growth of a long developing contempt for certain political institutions on the endurance of which may depend the life of modern civilization. For example, a national business leader recently back from Europe in telling of what he noted as to general conditions abroad spoke confidently of the rehabilitation of Austria. He attributed the rapidity of its progress and what he said was the certainty of its completion more to the fact that Austria's parliament had been suspended for two years than to any other move. This statement brought a laugh of approval from the men this business leader was addressing—men of thoughtful minds who happened to be unusually intimate with the operations of the United States Congress.

Parliamentary government throughout the world has

fallen into disrepute, not only among radicals and tories who oppose it on principle but equally among persons who believe that only through such government can human liberty be reasonably safeguarded. The contempt felt by those who are for it in principle is due to the shortcomings of parliamentary government in practice during recent years. These shortcomings are not owing, necessarily, to congresses and parliaments as an institution but to those persons who have been operating them—that is to the failure of the politicians to measure up with even partial success to the demands of the times.

This is a very important problem, and deserving of considerable thought and attention on the part of those of us who believe in representative government, who wish to avoid the tryanny alike of autocrat, bureaucrat and the mob.

Already the lines are forming for the great quadrennial national campaign of next year. It would be well now for the thoughtful voter to begin taking precautions against being controlled entirely by what the politicians will have to say about themselves and each other. Instead of being governed by what the politician says, it would be well to take serious note of what the politician is. For instance, in the long run it is safer to favor one who means what he says, though you don't agree with it, than to follow one who says but doesn't mean what you do believe in.

The public will be justified in looking with unusual suspicion on the entire current crop of politicians as a class. For they have failed, woefully failed, in rising even slightly to their recent and present opportunities for the exercise of true statesmanship.

The World Court.

Discussion of international affairs during the next year probably will revolve around the question of our taking part in the conduct of the World Court which is now in operation. This almost certainly will be the case if recent pronouncements as to the attitude of President Harding do not indicate that the White House has backed down on its advocacy of the affirmative side of that question. Upon the decision as to the World Court there will depend to great extent many collateral decisions as to future foreign policy.

You probably favor or oppose our joining the World Court and thus agreeing to abide by its decisions. Upon what do you base your position in the matter? If you favor it, is it because President Harding or the national administration is for it, or because you think it will be a step towards joining the League of Nations, or because of some other incidental equation that may have a great deal or very little to do with the worth or worthlessness of the tribunal? If you oppose it, is the opposition due to Senator Borah's position in the matter, or Senator Hiram Johnson's, or because you are a Democrat, or because you think we should join the League of Nations or else have nothing to do with its products?

If such are the grounds for either advocacy or opposition, your position in the matter is not well taken. Your opinion should be the product of genuine and thorough knowledge of what the World Court is or probably will become.

Yet one wonders how many persons in this country really know more than mere words concerning the World Court? How many can state the place where it sits, or the names of its judges, or even that of the American who is one of the judges? How many have correct information on its work to date, the cases it has handled and the dispositions made of them, or its powers, actual and presumptive?

Frankly, the writer of this could not answer many of those questions and to get answers to all of them would call for researches beyond all the voluminous matter published on the subject in this country since President Harding brought it to the fore a few months ago.

Yet this writer is inclined to nurture rather positive opinion as to whether we should take part in the court. He is inclined even to give rather emphatic expression to that opinion. Yet when the reason for it is examined, it is found that the opinion is based on virtually no knowledge of the court or its functions, but rather on old assumptions which may or may not be sound, and, if sound, may or may not be applicable to the subject in question.

For example, is it reasonable to assume *ipso facto* that our joining the World Court will mix us up at all or inseperably with the political affairs of Europe? To assume the reverse, without first informing oneself as to the facts, would be as ridiculous as to assume that the entering of the Court would mean the annulment of Washington's historic rule of non-interference with Old World affairs.

What would be emphasized here is the importance of informing oneself as to the facts before reaching fixed conclusions on an international question so intricate and possibly very important to us and the future. And it is a good rule to apply to other questions.

S. T. A. Meeting This Month.

Secretary Carter has announced that convention headquarters for the annual meeting of the Southern Textile Association, which will be held in Asheville, N. C., on Friday and Saturday, June 22nd and 23rd, have been changed from the Battery Park Hotel, as first arranged, to the Kenilworth Inn, where the sessions will be held.

The convention will brought to order Friday morning, the 22nd, at 9:30 o'clock by President John W. Cark. George W. Murphy, of La Grange, Ga., will make the response to the address of welcome, and he will be followed by President Clark in the presentation of his annual address. Joe M. Gamewell, general manager, The Erlinger Cotton Mills Co., Lexington, N. C., will speak on "Human Relationships in Industry," and the remainder of the session will be devoted to reports and discussions on carding and spinning conducted by B. R. Burnham and Carl R. Harris.

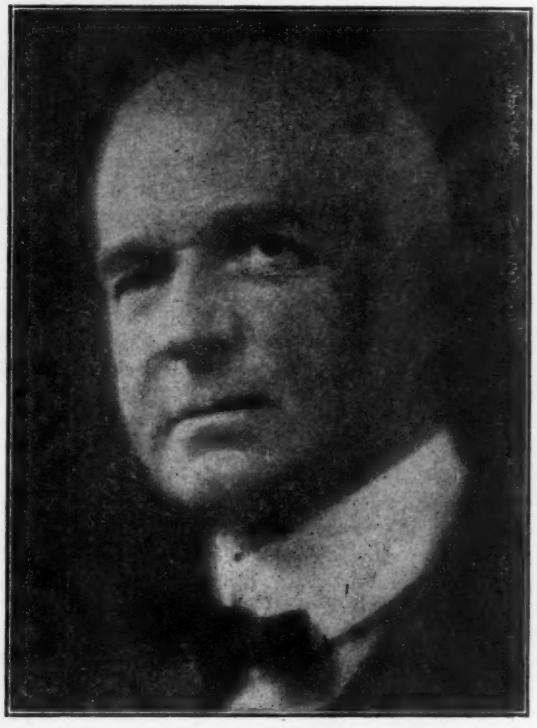
It is expected that a revised and enlarged edition of the film "Thirsty Cotton," the original of which was shown at the Wrightsville Beach meeting, will be exhibited at Asheville on Friday afternoon. The addition to this film includes a new reel telling the story of automatic regulation.

Friday evening a banquet will be held for the delegates, with Hon. J. G. Carpenter as the speaker. Saturday morning R. W. Jennings, general chairman, Textile Operating Executives of Georgia, will address the Association, and Charles E. Carpenter will speak on "Individualism Versus Socialism."

A Stabilized Stabilizer

In certain sections of the country and at certain seasons of the year a person may retire for the night with the stars shining and a normal condition of affairs obtaining outside his domicile only to arise a few hours later to find the earth blanketed in white, the driveways blocked with snow and even the entrances of his dwelling barred by drifts. This fleecy material comes silently, accomplishes its purpose quietly, and having done what it set out to do it makes no fuss about it, merely continuing to remain quietly quiescent while it awaits future developments.

There are some men in the world endowed with this same silent propensity. It may be subconsciously felt that they are around and doing something somewhere; but whatever it is it seldom attracts outside attention until it is all accomplished, and then it is the accomplishment and not the personality that brought it about that is most noticeable.



Colonel House, Woodrow Wilson's silent emissary, is a notable example of this type of person as he acquired an international reputation for his ability to refrain from emitting vocal sounds of any description, annoying or otherwise, and while he was quite evidently among those present during the peace conference, where folio after folio of more or less loose language was poured out upon a war-stricken world, the amount credited to him might be written on an ordinary postage stamp in a large and flowing hand.

Greenville, South Carolina, possesses another example of this unostentatious type of citizen. He differs somewhat from Colonel House in that he has no apparent ambition to be the unseen power that makes the wheels go around, whether those wheels be political or otherwise. But whatever he sets out to do is done most thoroughly, albeit the world at large or even his immediate neighbors may never hear a rustle to indicate that any definite accomplishment is in the process of being achieved. It has been said of him that he is a conservative, partly in the sense that he is averse to change, but it is also admitted that largely his conservatism is of the safe and sane variety that keeps what you have intact. Therefore, now that William Edgeworth Beattie has been elected president of the American Cotton Manufacturers' Association and has taken over the direction of the affairs of that body, it is perfectly safe to predict that during the ensuing year there will be no radical changes from the satisfactory and successful policy that has heretofore characterized its work. Also it may be indisputably prognosticated that there will be a "quiet zone" in the general vicinity of the presidential offices at Greenville, for whatever else he may be, Beattie is no prolegomenous babbler.

Away back in 1802 John Drayton published a historical work on South Carolina and in his description of the Greenville district he made reference to a rumor that a small bit of gold was said to have once been found on "Paris's Mountain." That the author was somewhat skeptical about the truth of this story is evident, because he adds, "but this is a report of what is said to have taken place many years ago." However, Beattie's grandfather didn't doubt the stories he heard of opportunities in the Greenville district. Neither did he harbor any ideas on conservativeness that would prevent his journeying from Virginia to South Carolina in quest of such opportunities. And it was this adventuresome spirit on the part of his grandfather that prepared the environment and evolved the factors which resulted in Greenville's being the exact spot on the map where, on September 25th, 1859, young Beattie first discovered he had a voice. However, there is a rumor, supposed to have been started by the nursemaid, that, even in those early days, young Beattie exhibited considerable reticence in expressing his opinion vocally.

In due course Beattie attended the local schools of Greenville and learned to play baseball, becoming the captain of the Greenville team at one period in his career. However, athletics was only one of Beattie's diversions; another was mathematics as is distinctly evident from later developments. Completing his studies at Greenville, he went to Princeton University, from which he graduated with an A. B. degree in 1882.

No mention has been made thus far of Beattie's father, who was the head of the First National Bank of Greenville, and who had much to do with influencing the younger man's ideas and outlook on business life. Organizing this bank in 1872 as the first bank to be located in Greenville County, the elder Beattie took his son, fresh from Princeton, and started him on the lower rounds of the banking ladder, and, during the time they were together, gave him the benefit of the ripe experience of years to aid him in properly

focusing his views on many important questions.

Young Beattie was directly connected with the bank for about 22 years during which time he had not only worked up to the position of cashier, but he had thoroughly absorbed his father's viewpoint on many things including speculation and conservation.

During this period, or about 1899, on the death of Joel D. Charles, Beattie was elected president and treasurer of the Reedy River Manufacturing Company, now the Conestee Mills, on the outskirts of Greenville.

In 1905 the death of Col. James L. Orr, president and treasurer of the Piedmont Manufacturing Company at Piedmont, S. C., left this concern without a directing head, and as Beattie's success with the Reedy River plant had attracted attention to his ability in this line, he was promptly chosen to fill the vacant position. He accepted the offer made him, and, resigning from the bank and his Reedy River connection, devoted all his time to the direction of the Piedmont properties—a position, by the way, which he still holds.

In 1914 the Parker Cotton Mills Co., a merger of some 16 mills that had been formed three years before by Lewis W. Parker, became badly involved and Beattie and M. C. Branch, president of the Merchants National Bank of Richmond, Va., were placed in charge to try to straighten out the financial tangle. The indebtedness of the company was liquidated by disposing of some of the mills in the group with the result that the remaining properties were saved for the stockholders. In 1916 this group was reorganized under the name of the Victor-Monaghan Company with M. C. Branch as president, and Beattie as vice president and treasurer. In 1920 Branch resigned and Beattie was elected president and since that time the company has operated with signal success under his direction.

Adding the spindles of the Victor-Monaghan group to those of the Piedmont organization gives Beattie command of the second largest group of spindles under southern ownership.

Right here it might be well to call attention to the fact that Beattie is no technical man on cotton manufacturing; he doesn't pretend to be. His rule for obtaining success is to gather around him a group of high class operating executives and let them worry about the details. Beattie demands results—tangible results, as demonstrated by substantial figures on the right side of the ledger. These figures tell him the story of success or failure, and the figures never lie—not to Beattie. If any one thinks, even for a moment, that he can arrange his financial figures so as to deceive Beattie's astute, figure loving mind, he has another think coming to him, and before exercising his option on that think, it would be well for him to have his thinker thoroughly overhauled and repaired. Beattie never did believe in speculation, as has already been pointed out, and trying to operate a business in which defective thinkers are an ingredient is speculation multiplied to the *n*th power.

However, there is one phase of mill activity to which Beattie directs his personal and ever-increasing interest and that is the development of sturdy manhood and womanhood, mental, moral and physical, among the people who work in his plants. Witness the attractive home surroundings, paved streets and walks, splendid schools, fine churches, generous recreation centers, etc., and above all, that spirit of contentment and happiness everywhere evident in the various Victor-Monaghan groups—with old as well as young. In other words, Beattie specializes in the fundamentals and he displays the keenest concern in the personal welfare, development and success of all those associated with him, deeming this to be one of the prime essentials in the continuing success of any industrial enterprise. If Beattie speculates at all, it is just here, and his speculations have paid handsome dividends. So vitally interested is he in it that it is one of the departments of his manifold activities to which he gives his personal attention.

One of the foremost features of Greenville to attract the attention of a visitor is the well paved streets of the city, This was another of Beatties activities inaugurated back in 1911 when he was chairman of the paving commission. He took much interest in this work as he felt it would be of great value to the city and its people.

During the war period Beattie was appointed by President Woodrow Wilson to serve on a committee to investigate whether or not it would be wise to fix the price of cotton and, it will be remembered, this was not done.

In addition to his other activities, Beattie is vice president of the First National Bank; a director of the F. W. Poe Manufacturing Co., and the Greenville Daily News. Also he is president of the Kiwanis Club and the Cotillion Club, vice president of the Sans Souci Country Club, and a member of the Poinsett Club, all of Greenville. His outside club connections include memberships in the Princeton Club of New York and the Biltmore Forest Country Club of Asheville.

Beattie is an active member of Christ Episcopal Church of Greenville and several years ago was made junior warden of that institution.

In 1885 he married Miss Kitty Marshall, daughter of Dr. Sam S. Marshall, and they are the joint and proud possessors of three children and six grand-children.

Being an ardent devotee of hunting and fishing, and a regular at golf, Beattie keeps in good physical condition, a factor which greatly aids him in the successful administration of his many business interests.

Beattie's characteristics include more than ordinary business foresight and a rather unusual intuitive development which frequently enables him to feel rather than know the causes that lie behind certain actions on the part of others, and his first impressions, while apparently hasty, are quite likely to be correct and are usually safe. He is persistent in his efforts, competent in the performance of any duties he may undertake, and can be counted upon to finish in a careful and conscientious way any project upon which he starts.

He is extremely approachable and never too busy to give due consideration to those who seek him. While he will listen with impartial patience and carefully weigh all the facts presented, his conclusions, though perhaps frequently tempered by lenieney or charity for what he considers the weakness of the man or his argument, are again strongly influenced by his intuitive judgment as to the proper course to take.

While of a slightly nervous temperament, its effects are largely counterbalanced by a similar tendency toward inquisitiveness. This allows Beattie to hold in temporary check the driving force of the first reaction while he thoroughly investigates a proposition and thus

satisfies the curiosity engendered by the second.

A quiet, courteous, lovable man, Beattie is thoughtful and considerate of those more or less dependent upon him, unaffected and unostentatious in his business relations, but resolute and resoureeful in attaining his objective. His sharp, penetrating eyes, with innumerable tiny lines radiating from the corners to reinforce the glint of humor which occasionally becomes visible therein, furnish a most potent index to his character; a much more reliable indicator than anything he says—because, usually, he doesn't say it.

(NOTE—Since the foregoing story was written, Mr. Beattie has announced his intention to retire from active business and has resigned from his position as the head of the Piedmont and Victor-Monaghan properties, one resignation having already taken effect, the other being effective as of June 30.)

American Cotton Manufacturers' Association Convenes at Richmond

For quite some time before May 16 there was in the air of southern textiledom a distinct premonition that something big was going to develop on that date, and it did.

Beginning on the 16th and continuing through the 17th of May, the 27th annual convention of the American Cotton Manufacturers' Association held forth in Richmond, Virginia, with headquarters at the Jefferson Hotel, and the result was that which is inevitable from the combination of this Association and Richmond as its host.

It was an unqualified success, and an enjoyable and beneficial occasion from start to finish.

Casting around for features to be especially mentioned is a rather difficult task—it was all of the highest grade. However, the charming, gracious and generous hospitality of Richmond, who lived up to every tradition for chivalrous courtesy and grace, must be particularly noted. The local entertainment committee, headed by John M. Miller, Jr., were on hand every minute to care for the desires of their guests. The ladies' division of the committee was very active, and were the worthy recipients of words of thanks and gratitude from the visiting ladies.

Among the features of the entertainment provided for the ladies was a dinner at the Richmond Country Club on Wednesday evening, followed by a theatre party where the play "It Pays to Advertise" was witnessed at the Academy of Music. On Thursday morning an automobile drive to historic points about the city was enjoyed, concluding with a delightful luncheon at the Flower Show.

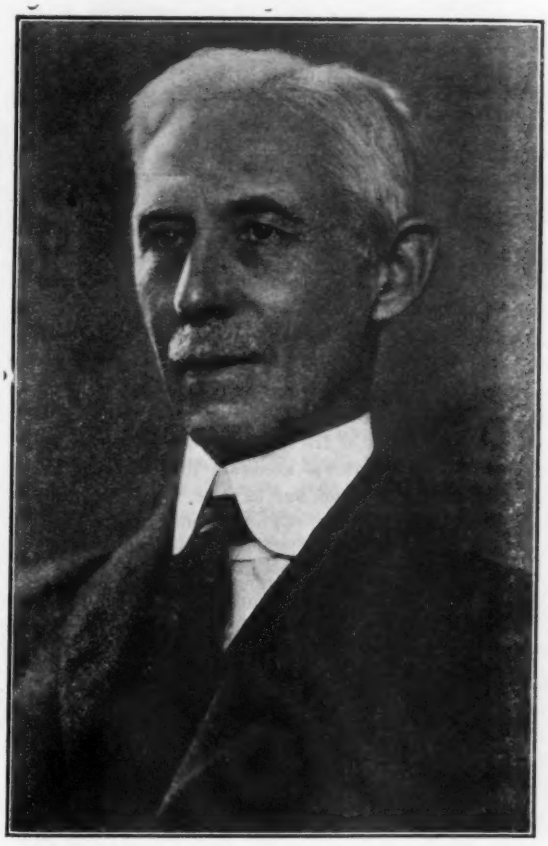
The concluding entertainment feature for the Association was a fitting climax to the splendid program scheduled throughout the convention. This final feature was a delightful luncheon at the Commonwealth Club, just a few doors west of the hotel, and followed the adjournment of the Thursday morning session. The famous colored sextette from the Lorillard plant entertained the visitors with selections of old-time southern melodies, combining with a most complete and palatable buffet meal to make the occasion most enjoyable.

While it was not officially announced as such, it is very safe to state that the attendance at this convention exceeded by a considerable number the highest anticipations. The lobby was thronged with delegates, and everyone enjoyed the occasion to the utmost.

It would be the acme of negligence to fail to mention the fact that attendance at the sessions of the meeting was noticeably large. This was undoubtedly an unmistakable tribute to the character of the program itself.

And to this must be given due consideration. Speakers of wide reputation and ability participated in every session, and one especial drawing card was the appearance of the Governor of North Carolina and the Governor of South Carolina at one session. Another Governor on the program was the chief executive of Virginia, who spoke at the banquet.

In addition to the super-excellence of the entertainment,



PRESIDENT C. E. HUTCHISON.

the program, the large attendance, another feature coming out at the meeting presents itself for just consideration, and that is the fact that the convention marked the close of a year of fruitful and wholesome activity on the part of the various officers and committees of the Association. This

fact was forcibly brought out in the reports of the officers and committee heads. It was shown that the Association starts the new year with a good foundation and a spirit for continued active work in the furtherance and greater development of the industry.

The convention consisted of four sessions; the first on Wednesday morning, the second Wednesday afternoon, the third being the banquet on Wednesday evening, with the final business session on Thursday morning. C. E. Hutchison, president of the Association, was the able presiding officer of the sessions and the toastmaster at the banquet.

The first session was called to order by President Hutchison Wednesday morning, following which Rev. T. F. McFaden made the invocation. The president then appointed the nominations and resolutions committees, consisting of the following:

Nominations—William D. Anderson, of Georgia, chairman; Aug. W. Smith, of South Carolina, and T. H. Webb, of North Carolina.

Resolutions—James D. Hammett, of South Carolina, chairman; M. L. Cannon, of North Carolina, and W. J. Vereen, of Georgia.

The President's Address.

was the next feature of the program. This showed careful consideration in its preparation, and in it Mr. Hutchison discussed matters of prime importance to the Association's members, including the subjects of labor conditions and immigration, transportation, future cotton supply, diversification in manufacture, effect of the boll weevil, exports, the question of the need for machinery repair parts plants in the South, etc., etc. His remarks follow in part:

"Reviewing the past year, as compared with the two previous years, we have just cause to congratulate each other upon the improved conditions throughout our nation, and especially upon the better conditions obtaining in the great textile industry. At the time of our annual convention of 1921 we hardly knew which way to turn, as the period of deflation was rampant in the land, and while conditions at the time of our convention in 1922 had greatly improved, the effect of the havoc of the deflation was still in evidence. While it was necessary that speculation had to be curbed and deflation had to come, it has been the impression of many able students of economics that the sudden and abnormal deflation of 1920 was accelerated by the acts of those in control of the Federal Reserve Bank by putting on the brakes too suddenly, certainly not through any ulterior motive, but from an error of judgment as to the results. Whether or not the final results would have been better had a different policy been pursued, or whether these criticisms were justified is a matter of conjecture only, as they had an unusual problem, without precedent in this generation, to handle. I consider the establishment of the Federal Reserve Bank one of the most constructive acts of legislation that has ever been put upon the statute books of the United States, and it is to be hoped that those who have our prosperity in their control will be guided by the hand of wisdom. I feel that business conditions are now upon a sound and stable basis and if prudence is observed we will have a continued season of prosperity. However, it is highly important, and I might say imperative, for the people to steer clear of undue speculation and keep their business well in hand if this condition is to continue.

Labor Conditions and Immigration.

"At the moment the labor situation seems to be in a fairly well settled condition, comparatively speaking. Advances have been made recently in most sections, and it seems that the present rates of wages are about in keeping with general conditions. It is commendable that these advances were made voluntarily by the manufacturers. Generally speaking, it is unfortunate that employers and employees cannot have a better understanding as to what is a just wage, and particularly that the employee does not fully realize that the employer cannot go beyond a certain point and allow his business to live, and that if the business could not survive they could not be employed, and also to understand that at times and often for protracted periods, the employer has no profit in his business. I believe in high wages, as high as the particular line of manufacture will stand, making due allowance for profitable periods and unprofitable periods, which must always be taken into account. It should be the duty of employers and the public generally to let the men and women who labor know that without capital there would be no industries in which to labor, and that without aggregation of capital they could not have the great opportunities and conveniences which they now possess, and to keep before them that many of the employers of today, and I might say most of them, have come up by work, steady application, and saving their earnings. I think I know the working people of the South, and I cannot help but believe that if actual facts were instilled into the minds of these people, they would hold the same views as we do, if they were not made subservient to the propaganda of the agitator, whose stock in trade is to sow seeds of discord, not for their benefit, but for his own personal gain. These people are nearly all native born, of Anglo-Saxon blood, of honest lineage and naturally patriotic, and should be educated to realize the great blessings they enjoy under our great and beneficent government as compared to the millions of starving and dying where communism runs riot.

"In this connection it is in order to discuss the question of immigration. We should take a lesson from the past as a result of the loose methods which have been observed in governing the indiscriminate entry of undesirable aliens into this country if we hope to preserve the glorious structure of our government. We have amongst us some who would like to tear down this structure, and their increasing propaganda is carried on in such an insidious manner that the public does not realize the work that is going on. There should be the strictest laws possible enacted to sift out all undesirable people seeking to enter this country. It is true that our present laws allow only a certain percentage of immigrants from any one country annually, but we should have additional laws requiring a rigid examination as to whether or not people seeking to come into this country hold views in full harmony with the institutions of our government and are destined to make desirable citizens. As a matter of fact, is it necessary or desirable to keep on flooding the United States with immigrants? If it is a question of securing additional labor to carry on our expanding industries, would it not be better that some of these extensions be temporarily delayed, and keep our own people fully employed at living wages, than to have hordes of people from every country flock to us, many of whom cannot be assimilated as well as many who do not want to be assimilated,

but desire to spread their propaganda of poison against our government?

TRANSPORTATION AND THE COAL SITUATION.

"These two matters I consider of the most transcendent importance of any before us today. If the great increase in railroad traffic is to continue at the same rate of expansion that it has in recent years, it is imperative that railroad facilities will have to be greatly enlarged and uninterrupted service maintained, as the embargoes and delays in shipments due to congestion of traffic are of vital concern to commerce and to the welfare of the public, and in times of peace ought not to be. Our government should give this question the most serious consideration and see that the railroads receive such attention and aid that they may be able to keep pace with the expansion of trade and for the general welfare and comfort of the people.

"It is essential that many necessities, notably coal, should be allowed to move freely at all times, which would avoid excessive prices and a detriment to the health of many people. In this connection, it is proper to consider the question of an adequate coal supply and transportation together. It is clearly the province of our national government to see that there is no hindrance to the operation of coal mining, either through the fault of the operators or miners, as well as no hinderance to transportation, for these directly affect the whole people; and it is certainly a matter not to be left to the states to handle. Some law should be devised without delay to take care of this situation. How this best can be done I hesitate to attempt to suggest; however, I might point out that I believe if the jurisdiction of all controversies arising in connection with these two most important branches of our commerce was placed entirely in the hands of our Federal Government, that it would have a most salutary effect and would do away with local feeling, which often hampers justice. This may appear premature, but I am bold enough to predict that something like this will finally be the solution of this perplexing problem, and when this is done, the feuds and strife arising from these controversies will be a thing of the past, or at least be greatly minimized.

COTTON SUPPLY AND THE BOLL WEEVIL.

"The cotton trade of the world has for the past several years viewed with alarm the possibility of being faced with an insufficient supply of cotton to keep the mills in operation and supply the wants for cotton goods. This has been largely due to the ravages of the boll weevil and the continual encroachments of the boll weevil into territory hitherto unaffected. However, there has been no famine in the cotton supply; but had it not been for the greatly decreased demand for cotton from European countries since the beginning of the World War, no doubt we would have seen the spectacle of mills in America and Europe standing idle for want of raw material. Owing to the great importance of cotton to the world and the interest aroused in the destruction of the boll weevil, a nationwide campaign has been inaugurated, organizations formed, scientists interested and large contributions in money made to devise means on a broad scale to counteract the great damage done by this destructive insect. I have implicit faith that the depredations of the boll weevil will be overcome and that the production of cotton in our southland will again become normal, but when that time comes, I hope our people will not do as they have done in the past; that is, plant cotton almost exclusively, but adopt the more sensible method of first making the farms or plantations absolutely self-sustaining by raising sufficient food and feed crops, as well as hogs and other livestock, and then plant whatever cotton they desire and use intensive cultivation and fertilization. Then I think we will raise plenty of cotton on less acres of land, and the planters will not be forced to sell until prices justify as they will be independent of the debts incurred by buying their supplies from the West at high prices. Up to the present time, the cotton growing states of the United States have had almost a monopoly in the raising of cotton as compared with other countries. However, quite a large amount of cotton is grown outside of the United States, but it is grown in smaller quantities in a great many sections of the world far remote from each other. The great statesman, John C. Calhoun, many years ago made the statement that cotton could not be successfully grown below the frost line. I do not know upon what he predicated his statement, but it seems that this has proven to be correct in a large sense in sections located below the frost line, except in the case of the valley of the Nile. But if this menace of the boll weevil continues indefinitely it is uncertain to predict just what might happen to take away this monopoly from our country, as the growing of cotton has for many years been fostered by the governments of several nations.

WINSTON D. ADAMS, SECRETARY AND TREASURER.

"Laying aside the interest we may have in having a supply of cotton for our own mills, it would be a serious blow to the United States to lose its supremacy in cotton growing, as the exports of cotton help every section of our country from the fact that it has, more than any other article of export, for many years up to the World War, kept the balance of trade largely in our favor, and if we can again raise reasonable sized crops in the future, and conditions in the European countries become normal, no doubt this will continue to obtain.

DIVERSIFICATION IN MANUFACTURE.

"My able predecessor, in his annual address at our last convention, stressed the importance of our southern manufacturers giving their attention to diversification in manufacture, to turn to other lines than the staples. I am glad to see that this is being done to a considerable extent. Many new plants are now being established to make and finish the finer grades of cotton goods. The time has come when it is essential to do this as there are too many mills now making the coarser cloths and yarns for the market. The finish of our products should be carried as far as possible from the raw material. It is essential, however, that a full investigation be made by those who contemplate going into new lines of manufacture, and that they get data as to the prospective supply and continued future demand for that particular line of manufacture. It is to be hoped that this movement will continue, as there is no reason why we should not be able to make any class of goods manufactured.

EXPORT TRADE.

"Our export trade has for years been one of much concern. I am glad to see that this trade is making fair progress, but it is not as great as we would like to see. During the years 1918, 1919 and 1920, the total value of exports of cotton manufactures rose to considerable proportions. This, however, to a large extent was due to the high prices prevailing during that period. Compared with the total value of exports for the year 1913, the exports for 1921 and 1922 make a very creditable showing. According to figures of the Department of Commerce, the total value of exports of cotton manufactures were, in round figures, $55,518,000 in 1913, $177,234,000 in 1921, and $138,700,000 in 1922. The Department of Commerce as at present functioning, should be commended for the intelligent and business-like manner in which it is securing data, disseminating information and aiding in the development of our foreign trade.

UNITED STATES COTTON STANDARDS ACT.

"Doubtless most of you know something about an act under this title passed at the last Congress, but probably few of you are familiar with its provisions. It seems that this law was passed in such a quiet manner that the cotton manufacturers were not aware of what this bill contained. I believe that most of them had in mind that it was to govern transactions on the cotton exchanges only. As this law creates quite a radical departure from our present methods of the cotton trade, it is a matter of considerable importance to the manufacturer, and I have asked a member of our Association, D. M. Jones of Gastonia, N. C., who is a cotton merchant as well as a manufacturer, to address us on this subject at our meeting tomorrow morning, and I hope as many of you as possible will be present to hear his remarks.

DEVELOPMENT OF OUR INDUSTRY.

"The development of our industry in the South has drawn the attention and amazement of the world. Not so many years ago, the South was looked upon as almost strictly an agricultural section. Our people poor and in debt, having had practically everything swept away by the Civil War, with a courage born of determination, knowing their capability, went to work, kept their faith, preserved their most precious inheritance, honor and patriotism, worked and planned against many odds, and laid the foundations for an industrial empire, not of cotton manufacturing alone, but of other industries as well, in a space of time and under circumstances of which history has no parallel. Today the South has over 16,000,000 spindles in operation, of which statistics show that more than 4,000,000 have been added in the last decade, with many new plants planned and under construction, which will add approximately 750,000 to 1,000,000 spindles for 1923; and yet this development is still in its infancy, and it is difficult to predict its extent in the next decade.

"The South is peculiarly well adapted to industrial development on account of its mild and healthful climate, the character of its labor and the satisfactory laws of our different states. So far our lawmakers have acted wisely and have seen the beneficent results of reasonable and fair laws, which have been so advantageous to the employers and employees and the development of industries, which have made possible splendid educational facilities, the building of modern highways, etc., which otherwise could not have been possible. It is to be hoped that with this object lesson before them, our future legislators will follow in the footsteps of their predecessors who wrought so wisely. I deem it fitting to say that it is the patriotic duty of all citizens, without regard to party affiliation, to take a hand in the selection and election of candidates for office, particularly legislative offices, and to see that capable men of the highest integrity and broad vision, who can see all sides of any question, are put in office.

MACHINERY AND REPAIR PARTS PLANTS.

"Inasmuch as indications point to a continued development of the textile industry in the South, a problem has arisen that challenges the serious consideration of our membership, and that is, the need of textile machinery and repair parts plants in the South. I have been reliably informed that fully four-fifths of all the new spindles now being manufactured by existing textile machinery plants for installation in this country, are for southern erection. It has been likewise estimated that the replacement demands for machinery from the South will soon range over a million spindles annually. In the light of such a condition, is it to be wondered at that many of our most influential and farsighted manufacturers are agitating the importance of a southern textile machinery industry commensurate with the needs of the situation? The raw material is available, labor is abundant and of such a character as to be quickly utilized; the market for the output is close at hand, and there is no adequate reason why we should be compelled to depend on plants situated at remote centers which, in the very nature of things, makes for expensive equipment and maintenance of our mills, and the resulting uneconomic supply and distribution of our products.

THE FORDNEY-MCCUMBER TARIFF BILL.

"Since our last convention, the Fordney-McCumber Tariff Bill, that had been in the making during the past two years, has been passed. Stuart W. Cramer, chairman of our legislative and national committee, will include this subject in his report. One feature of the tariff situation that still demands our attention will be the subject of a special resolution which will be offered by Mr. Cramer.

"In this connection I deem it appropriate to state that Mr. Cramer, as chairman of our tariff and national committee, has had to spend a great portion of his time for the past two years in looking after legislative and other matters

of vital importance to our Association, and deserves the thanks of every member of the Association for his invaluable service and unselfish devotion to the important duties imposed upon him.

COOPERATION WITH OTHER ASSOCIATIONS.

"The interests of our country are so closely interwoven that no one industry can be prosperous for a long period while other industries are non-prosperous, and no one section of our country can long be prosperous and nearly all other sections otherwise. We are all people of a common country; what affects one, in the end affects the others; our ideals and aspirations are the same; therefore I deem it important that we maintain the closest and most cordial relations with similar Associations, especially the National Association of Cotton Manufacturers.

"Our traffic committee, as usual, has been active in looking after all matters coming within its scope, and its chairman, Captain Ellison A. Smyth, and the traffic manager, George W. Forrester, deserve high praise for the splendid manner in which this work has been carried on.

"In closing, I desire to commend to the Association the services of our efficient secretary, Winston D. Adams, for his intelligent and alert attention to everything pertaining to the interests of our Association."

Following the presentation of his own annual report, which was well received by his auditors, President Hutchison introduced Hon. Edgar Watkins, of Atlanta, Ga., as the final speaker of the session. Mr. Watkins is one of the leading attorneys of the South, being counsel for the Association's traffic committee, and his remarks were therefore received with interest, his subject being

Transportation, a Part of Production.

Mr. Watkins spoke in part as follows:

"A discussion of the charges for transportation is a somewhat prosaic subject but one intensely practical. The United States grows only from one-half to three-fifths of the cotton supply of the world and you compete in world markets with manufacturers everywhere. The cost to your competitors and to you of the product sold by each is affected by the charges for transportation. Essentially, therefore, transportation is a part of production.

"Generally we speak of production as including only the service performed by the grower. This too narrowly restricts the meaning of the word. Production properly defined includes every service necessary to prepare a commodity for use by the consumer. The farmer plants, cultivates and gathers and thus produces raw materials. The manufacturer changes the form of the raw material, better to fit it for human needs, and produces form utility. Transportation companies move commodities to where they are needed and produce place utility. The merchant stores and holds, adding time utility to the commodity. All these services are necessary to produce commodities. Therefore, I have taken as my subject 'Transportation, a Part of Production.'

"The seed, the fertilizers, the stock and the farm implements used in growing raw material may all bear transportation charges. Coal, machinery and supplies used by the manufacturer, as well as the finished product, must generally pay for the service of transportation. These comprehensive transportation services involve cumulative costs, the total of which is a substantial proportion of the amount the consumer must pay.

THE IMPORTANCE OF FREIGHT RATES.

"As already indicated, the cost of transportation increases the cost of the commodity. This cost is generally paid by the consumer. This being true, many of the agencies performing the several services of production regard freight rates, so long as there is no unjust discrimination, as something in which they are only indirectly interested. Manufacturers, as they usually add all transportation costs to their selling price, frequently act on the assumption that so long as their rates are relatively fair the amount thereof does not affect their business. There is a difference in the effect of the amount of the rate and of the relationship of rates, but both are important. This is especially true with textile manufacturers.

ABSOLUTE RATES.

"When you reckon your cost of the manufactured product you include the cost of the raw material, the cost of the various items which go into manufacturing, and as part of the cost of these is the cost of bringing to the place needed the raw material, and the different kinds of machinery and supplies which are used in the manufacture of your product. These freight charges add substantially to the final cost of the completed commodity.

"So long as the consumer buys the commodity and pays a fair profit to the manufacturer, the manufacturer has but little interest in the amount of the freight charges advanced by him. But your commodity is not an absolute necessity, and the amount of the consumption of the products you manufacture is affected by the ability of the consumer to buy. The consumer's purchases are also limited by what is called the competition of desires. If your price is high, the consumer may buy less of the commodity, and he may also conclude that some other commodity will serve his needs as well or better, considering the price and relative desirability. There is therefore a marginal point in the price of your goods, which, if exceeded, will decrease their use. It therefore follows that every element entering into the final cost of your completed product has its effect on the amount of the product that you can sell. You are thus interested in seeing that the rates paid shall not be higher than necessary.

RELATION OF RATES.

"While you are interested, as has already been shown, in the amount of the rate paid, you are very much more interested in the relation of the rates. If your competitor pays less transportation costs on his raw material supplies and machinery, than you do, he can manufacture goods cheaper than you can, everything else being equal. With his manufactured product costing him less than yours, he can undersell you and take from you some of your markets. You can not pass on to the consumer a higher cost of transportation than your competitor pays, and you must absorb any excess of the cost which you pay over that which your competitor pays. It is therefore of supreme importance to the textile industry to have rates relatively just and reasonable.

"The location of the cotton manufacturing industry in New England and of the territory of raw material production in the South existed when the railroads first became important in transportation. This situation resulted in the railroads establishing such a system of rates as would aid the New England manufacturers by enabling them as cheaply as possible to get their raw materials. This was probably what the rail carriers would have voluntarily done,

but such system was practically compulsory because of the fact that through the South Atlantic and Gulf ports, and down the Mississippi river cheap water transportation was available for the movement of cotton to New England ports. The desire of the different parts of the growing territory to reach the manufacturing plants as nearly equally as possible, caused the grouping of points of origin in rate making so that from practically all of the South there were rates widely differing in amount. A similar reason caused the manufacturing territory to be grouped, and there was little difference in rates to the several manufacturing points in New England.

"Europe participated in this group system, and rates to the European manufacturing centers were not greatly different, nor did such rates materially vary from the rates to the New England manufacturing centers. Ocean freight rates are not stable, but typical rates of normal times, those in effect Nov. 18, 1910, illustrate the effort to equalize cotton manufacturing centers. These rates for 100 pounds were: From New Orleans to Liverpool, 38 cents; to Manchester, 35 cents to 38 cents; to Bremen, 33 cents to 36 cents; to Havre, 34 cents to 37 cents; to Antwerp, 30 cents to 38 cents; and to Genoa, 31 cents to 35 cents.

"Professor Copeland of Harvard, in his interesting book 'The Cotton Manufacturing Industry of the United States,' after citing the foregoing rates, concludes as follows:

> "In other words the ocean rates are practically the same from New Orleans to all the chief cotton importing ports of Europe."

"The statement made as to Europe, would at the time have been applicable to the New England mills, the rates to which, from New Orleans, were similar to the rates quoted from New Orleans to European mills. These rates, even as late as 1910, were the result of the original supremacy of the New England mills in the textile industry. While the growth of the textile industry in the South began some twenty-five or thirty years prior to 1910, the original influences which determined the relative rates were permitted to determine largely the rates that were continued by the carriers.

"As the industry developed in the South, rates on raw cotton to the mills were made approximately the same, except for short hauls, as the rates to New England and Europe. The idea of the carriers seemingly was to permit the manufacturer, wherever located, to obtain his raw material as cheaply as his competitor.

"Prior to the war, the rate from the plantation to Memphis for 150 miles was 30 cents per 100 pounds; from Memphis to Boston, 57½ cents. The rate from Memphis, which was then and is yet, the greatest inland cotton market, to the Georgia and Carolina mills, was as high and in some instances higher than the rate from Memphis to the New England mills.

"This rate system, largely to the exclusion of any consideration of the greater distances, gave equality both to Europe and to New England with the South. Manufacturers, wherever located, could own cotton at the mill at practically the same price. Cotton grown near a southern mill of course gave the mill an advantage, but it is generally true that even the Carolina and Georgia mills must ship in raw materials from Memphis and further west.

"The manufacturer in Europe and New England had near him a large consuming market and therefore had to pay much less freight from his plant to the consumer than the southern mills, these having to ship longer distances to reach the densely settled parts of the country. The Middle West, north of the Ohio River from about Cleveland, O., to Chicago, broadly Central Freight Association territory, the West and more pronouncedly, the Southwest, are nearer the southern mills than New England. Formerly the rate adjustment gave New England the same rates as the South had to the territory west from Cleveland to Chicago. To points further west and to the southwest, New England had rates related to distances less than the South. Here again the advantages of the location of the southern mills were

taken from them by the rate system adopted. At present this Central Freight Association territory, as is proper, can be reached by the southern mills at lower rates than can the New England mills.

"From this brief history it appears that the group system of making rates adopted by the carriers had the effect and probably was intended to have the effect of equalizing the commercial conditions in such way as to make of no value any particular location in so far as getting raw material affected the situation. The advantages of nearness to a densely populated consuming territory, however, remained to Europe and New England, although the rapid growth of the South is giving to the southern mills an increasing nearby market.

"Widely known engineers at a recent conference in Boston discussed a paper with the significant title, 'How Can New England Meet Its Textile Problem?' This paper pointed out some of the advantages the southern mills have over New England mills. The advantages stated relate principally to the cost of labor, expenses and taxes. The southern mills were shown to be at a disadvantage, although a gradually decreasing one, in capitalization, and to have no advantage in supplies and power. The cost of cotton and waste to the New England mills for a named period was put a 34½ cents per pound, while the like cost to the southern mills was 34 cents per pound, a difference of only ½ of a cent. So as late as this year the freight rate advantages which should result from the location of the southern mills are practically nullified.

"While the advantages of the southern mills, because of their location near where cotton is grown have been neutralized to some extent by the rate system, other reasons have contributed to increase absolutely and relatively the number of spindles in cotton mills in the South.

"In 1900, 75 per cent of these spindles were located in the northern states; their percentage is now but 55. Since 1900, the increase of spindles in the southern states has been 350 per cent, while the increase in the northern states has been only 40 per cent. (Cotton Facts Nov. 1922, p. 150.)

PREVENTION OF WASTE IN TRANSPORTATION.

The Interstate Commerce Commission is now 36 years old. In my opinion, it has been composed of abler men, who have exercised greater wisdom, than any other like commission organized in the United States. Its first chairman was Thomas M. Cooley, one of the greatest lawyers of America. While there have been some politics in the appointments to membership on that commission, it possibly has been as free from political appointments as the Supreme Court of the United States. There have been and are now, men of great ability members of that commission. Notwithstanding these facts and notwithstanding the immense improvement of means of transportation and the greatly increased amount of business, rates are at least 60 per cent higher than they were when the commission was created. During the life of the commission, thousands of questions have been presented to it, and yet there are today more complaints being filed before that commission than heretofore. This record does not indicate complete success.

"It may be that private business can be better regulated by the owners of the business than by any governmental agency. Certainly if a governmental agency can regulate the railroads, there has been full opportunity in the 36 years of the existence of the Interstate Commerce Commission for that Commission to demonstrate its usefulness. In the many complaints decided by that commission, it has done little in a fundamental and comprehensive way to solve the transportation problem.

"However, governmental regulation is with us, and instead of speculating as to what might have been without such regulation, we must consider the use that we shall make of the regulation. One thing the commission can do, and this it is endeavoring to do in the Southeast now—that is, comprehensively to study general conditions and to apply general remedies. What the carriers must do is to make

more economical and efficient their transportation systems. I am not engineer enough to know all that should be done. I do know some things that should be remedied, and which, it seems to me, can be remedied.

"Recently the General Traffic Manager of the Louisville & Nashville Railroad testified that the tariff publications of that road for the year 1922 cost $750,000. 10 per cent of this ought to be adequate. In a discussion of the situation in Atlanta, Ga., railroad men recently claimed before the Georgia Public Service Commission that it took from five to eight days to move a car of freight from one plant to another within the city of Atlanta. This is probably the fault jointly of both shipper and the carrier, but it is a situation that should be and can be improved. The average speed of a freight train was, in 1922, 10.3 miles per hour, which was 1.4 miles less than such speed for 1921.

"In 1922, the amount of business done by the railroads less than that of 1916, was freight ton miles 6.2 per cent and passenger miles, 2.9 per cent. Notwithstanding the lesser business in 1922, the net operating revenues over 1916 showed an increase of 55 per cent; maintenance expenses increased 95 per cent and labor payroll 77 per cent. For less service in 1922 the carriers collected from the shippers two billions more dollars than for 1916; but their net railway operating income was $292,000,000 less in 1922 than in 1916. The relatively high percentage of increase in maintenance was, at least in part, one of the results of the Federal control of railroads, and probably there will be less need for high maintenance expenses in 1923 than there was in 1922.

"Federal control unquestionably disarranged the transportation service, and the cost of Federal control is being paid in every rate now charged. The direct cost to the United States for 26 months of Federal control was, in round numbers, two billion dollars. Just how much it cost the public no one can accurately state. In 1922, the operating revenues of all the railroads in the United States were five and six-tenths billion dollars. Notwithstanding these higher rates, 235,000 miles of railroad in the United States earned a net operating income of only 4.14 per cent. The southern railroads earned 5.04 per cent during the same time and are thus in better condition than the roads of the United States generally.

"These figures show an immense increase in the cost of transportation, yet they do not show that the owners of the transportation systems are earning adequate returns on their investments. Rates on many commodities are now as high as the traffic will bear, and increased rates would lessen the movement of these commodities and reduce the carriers' revenues. How then can the carriers earn fair returns without increasing rates? This is a problem that must be solved, if our present system of industry is to be maintained. Increased labor costs for unit of labor will probably continue, although here is offered a possibility of a clash between the Farmer Bloc and the Labor Bloc, each of which is powerful in the halls of Congress. The consumption of pounds of coal for unit of freight and passenger service increased in 1922 over 1921 by approximately 10 per cent. Freight trains moved 10 per cent slower in 1922 than in 1921. Other facts might be presented if time permitted which show that there is opportunity for the carriers to reduce their cost of transportation and thus reduce their rates, while at the same time increasing their operating income. The Interstate Commerce Commission, instead of as heretofore treating symptoms, should determine fundamental principles, but the chief remedy that must come will come from the railroads.

"One of the mooted remedies is to consolidate the railroads of the country into nineteen systems. In the South it is proposed to have three systems, one dominated by the Southern Railway, one by the Atlantic Coast Line Railroad and one by the Illinois Central Railroad. If the courts had not stopped Harriman, there would probably have already been a consolidation of the railroads. Proper mergers of what are now separate systems may accomplish some economies of operation; but care must be exercised that there be left the incentive for competition in service. There is now no possibility of competition in charges. Inter-regional rather than regional systems, as proposed by the Interstate Commerce Commission (63 I. C. C. p. 455) would give greater recognition to the economic unity of our country and would probably be better than the tentative program now under consideration. The question is too broad to discuss here, but attention to the importance of the question should be aroused. It is rather remarkable the scant consideration shippers have given and are giving to this proposal.

"It has been suggested that a car pool would result in greater utilization of equipment, with a consequent decrease in the danger of car shortages. It is probably true that a voluntary pool of all the systems or railroads under which cars could be jointly owned and distributed would be helpful. There must, however, be great care in fixing the method of distributing cars to the respective members, and it is easily possible for a car pool to be more harmful than beneficial.

"Private car owners have some advantages in procuring cars over other shippers. Just how far these advantages will be continued is a question now pending before the Interstate Commerce Commission. You are interested in car distribution, especially of coal cars. Shortages of coal cars mean danger of serious loss. Your business is served by contracting for coal before the date when the coal will be needed. Mine ratings should be and legally can be determined as of the date of these future contracts, instead of as now at the date of shipment. This is an economic view which the Interstate Commerce Commission might not take. But as contracts for future delivery of coal are economically sound, there is equal economic reason for contracts for the future furnishing of cars.

"There is another remedy that will in my opinion do some good, and that would be the repeal of the so-called Guaranty and Recapture Provisions of the 1920 Transportation Act. A United States court has just held that a carrier earning more than 6 per cent must, in conformity with that act, pay to the Interstate Commerce Commission of the United States, and for uses as provided by the Act, one-half of its operating income in excess of 6 per cent. The argument of the court is plausible, and the conclusion will likely be sustained in the Supreme Court. This removes one of the great incentives that the carriers would otherwise have for efficiency and economy. The only way the best service can be obtained from the private owners of the railroads is to give such owners an incentive for their best

service. This incentive does not exist when there is a guarantee of earnings, and is lessened when the excess over 6 per cent earnings is divided with the government.

"The railroads need more freedom, and with a new freedom to the owners of railroads will come greater efficiency, greater economy, lesser rates and better income.

"The labor situation as shown by the large increase in labor cost is another problem that the carriers must meet. The Labor Board provided for in the Transportation Act of 1920 seeks through the sanction of public opinion to exert an influence in labor controversies. Speaking of this Board, the Supreme Court recently said:

> "The only sanction of its decision is to be the force of public opinion invoked by the fairness of a full hearing, the intrinsic justice of the conclusion, strengthened by the official prestige of the board, and the full publication of the violation of such decision by any party to the proceeding. The evident thought of Congress in these decisions is that the economic interest of every member of the public in the undisturbed flow of interstate commerce, and the acute inconvenience to which all must be subjected by an interruption caused by a serious and widespread labor dispute, fastens public opinion closely on all the circumstances of the controversy and arouses public criticism of the side thought to be at fault. The function of the Labor Board is to direct that public criticism against the party, who, it thinks, justly deserves it."

It may be admitted that the Supreme Court accurately stated the purpose of Congress in creating this Board, but recent experiences have demonstrated that this purpose has not been accomplished. Practically, the Labor Board has authority only to meddle and has little influence over public opinion.

"It should not be inferred from what I have said that the carriers have done nothing to promote efficiency and economy of operation. They have accomplished something; they are operating, said President Loomis of the Lehigh Valley at a less annual cost by two billion dollars than under Federal control, but there are further opportunities for improvement, and to show improvement over conditions during Federal control is not enough.

"It has already been shown that the measure of the rates is of interest to manufacturers, although not of such direct interest as the relation of rates. The measure of rates now is greatly higher than ever heretofore. There are two rates in the United States that are largely determinative of the rate systems in the country. One of these is the rate from Virginia cities to Atlanta, which practically delimits the class rates throughout the Southeast; the other is the rate from New York to Chicago, which largely determines all rates east of Chicago and north of the Ohio and Potomac rivers, and which exerts a considerable influence on the rates west of the Mississippi river. When the Interstate Commerce Commission was created, the first-class rate from New York to Chicago was 75 cents, and from Virginia cities to Atlanta, 79 cents. These rates are now, from New York to Chicago, $1.42, and from the Virginia cities to Atlanta, $1.41.

"Cotton rates on the raw product in 1907 and now, for typical movements, are shown in the following table:

From	To	1907 Rate	Present Rate
Farm	Memphis (150 mi.)	$ .30	$ .65½
Memphis	Boston	.57½	1.20½
Memphis	Gulf	.30	.76½
Augusta	Charleston	.21	.45
Augusta	Norfolk	.26	.67½

"In 1907, the 500-pound bale of cotton moving from a point 150 miles from Memphis, to Boston paid through freight charges of $4.27. Such charges are now $6.42. These indicate the greatly increased rates that are now being paid, but the increase in local rates in the South has greatly exceeded in percentage the increase in through rates to New England.

SOLUTION OF YOUR SPECIAL PROBLEM.

"If the aggregate of the inbound haul and the outbound haul were equal for the different localities, the rates might likewise be equal, but it is a fair adjustment when the total distances are not the same, to fix the combination of the inbound and outbound rates so that the sum of both will be the same for all localities. While that principle has not been carried out absolutely, it is the basic principle of the rates on cotton and cotton goods. There is a commercial advantage in having all factories paying the same total rates. This extends competition to different territories. It is not, however, legally right to deprive any community of the benefits of its location, and it is an economic waste for any commodity to be hauled a longer distance than is necessary. There should be such rates on the raw cotton to the factory as will be fairly compensatory to the carriers and fairly related, distance considered among all shippers. The same rule should be applied to outbound rates. The cotton mill located near where the cotton is grown should not be deprived of the advantages of that location. A cotton mill located near the consuming market has an advantage in distribution which should not be taken away from it. The increase in population and wealth of the South is furnishing and will continue to furnish the mills located in this territory, an enlarged market. The market in the Central West is nearer the South than New England and the South should have the advantages of that situation.

"The system now in force is based on grouping both origin and destination territories, a system possessing the characteristics of an artificial equalization. The system has not been without its advantages in the past and there is some argument for the continuation of the system, but as already stated, it is an artificial equalization of differing natural advantages, and to that extent is uneconomic and violates the law. No carrier, nor any legal tribunal has authority to deprive communities of their natural advantages.

"It has been suggested that a straight mileage system of rates should be adopted. The advantages and disadvantages of a mileage system have within the last year been presented extensively and with much useless detail and at an unnecessarily large expense, to the Interstate Commerce Commission. The question is now before that commission and, being of counsel in the case, I shall refrain from expressing any views as to what the decision should be or is likely to be. I may say, however, that theoretically mileage fairly adjusts relative advantages—that practically some grouping is required in all systems of rates. The so-called mileage system is not based like passenger rates on each mile, but is based upon blocks of miles. There are groups in the proposed mileage system of five miles, and as the distance increases these blocks increase until they become groups sometimes of 50 miles. This problem will in my opinion be settled by the Interstate Commerce Commission in the Southeastern class rate case. It is true that this case does not affect commodity rates directly, but indirectly it does, and the adjustment which may be estab-

lished in the present case will probably be followed at least to some extent in the commodity case later to be heard.

"There are reasons, however, why group rates should be applied to heavy commodities like cotton, which do not exist with reference to class rates. Whatever should be done, should limit rates to reasonable rates, should give fair recognition to the advantages of localities and should be free from all unjust discrimination. If you gentlemen get such rates, you will not fear the competition of any other territory or territories, and you will be able to conduct your business so as to give adequate service to your customers and to earn for yourselves fair returns for that service. Yours is a great business, a business that has been generally prosperous and a business that has developed the territory wherever you have located. Your service has been constructive and insofar as transportation affects that service, you are entitled to fair treatment from the carriers. You have advantages in location near where the raw material is produced, in the class of labor available to you, and in other ways. These should not be taken from you in whole or on part.

LOSS AND DAMAGE CLAIMS.

"You do not want a loss or damage claim. You want your goods promptly and safely transported. The amounts paid because the carriers have not fully complied with their contracts of shipment are unnecessarily large, but not nearly so large as the actual loss to shippers. Here the carriers have opportunity for savings for themselves and for the shippers. My firm finds frequent occasion to advise you of your rights to receive pay for your losses and in some cases suits have been necessary to obtain your full rights. The full damages which the law requires as decided by the Supreme Court, should be paid you. You ask no more; the carriers should offer no less."

Second Session.

The afternoon session consisted of a thematic discussion by Governor Cameron Morrison of North Carolina and Governor Thomas G. McLeod of South Carolina on the subject of "The Duties and Responsibilities of a State in the Development of its Industries."

This was certainly one of the best attended sessions of any convention of the Association for some time, and congratulations are in order for the selection of such a vitally important subject and the securing of two representative chief executives of the South to discuss it.

Governor Morrison was the first speaker, and devoted a large part of his remarks to an appeal to the business men of the country to take an active part in politics in their native states. He also stated that adequate, just, equitable protection was the chief duty of the state toward its citizens, and vigorously denounced class distinction, violence and intimidation on the part of any group of a state's citizenry. He spoke in part as follows:

"I have been requested to appear before you and discuss the duty of the state to its industries. I am going to comply with your request about the matter and then I am going to ask you to let me talk to you about what I would like to talk to you about, and that is the duty of those who manage industry to the state.

"I fear that the responsibility and importance of state government has become obscured in the minds of the citizenship of this great republic of states. We all take great pride, as we should, in the United States government, but great as that government is, honored and respected as it is throughout all the earth, if that was the only government we had we would not have any government in this great republic adequate to protect the citizen in his most primary rights, adequate to give any man's life, property or other thing held dear governmental protection.

"Much of the greatness of the United States government comes from the fact that through it the greatness of the state government is expressed. The United States government, as you all know, was set up by the founders of our mighty fabric of free government for the purpose of discharging a few, distinctly enumerated governmental functions. It was never intended to be a complete government. It was only established for the purpose of doing those things which it was to the interests of the states to have unity about and move together about. It was given the power to conduct foreign relations for us, coin money, regulate interstate commerce and do a few other vitally important things and that is all.

"It cannot pass a law against murder unless it were for a federal office-holder—and sometimes people wish it could not then—it cannot pass a law against the larceny of a citizen's property. There is no pretense of authority in it to pass a law regulating ordinary contracts in the commercial life of the people, though it may enact laws for enforcement between different states. It is not and never was intended to be a complete government, but it is a government of a few distinctly-enumerated, granted powers, without which the states would be weak and unable to protect themselves against foreign aggression, regulate commerce between themselves, furnish a nation-wide currency and a few other things, but the United States is made glorious and strong and adequate because there was left in the states and in the people almost all governmental powers.

"We find a great many citizens who honor the United States government and love it, but practically hold the state in contempt; we find other men who hold the state's rights inviolate and love the state with great devotion, but almost hold the United States government in contempt, but a citizen of this great republic is half a traitor who doesn't love both and stand ready to die in defense of them.

"As time goes on the citizens of this republic will come more and more to realize that the state government is necessary to give the citizens of this country complete, full, well-rounded government under which they can work out a great democratic civilization.

"What is the duty of a state to its industries? The duty of a state to its industries is not special, but general. The duty a state owes is not to any particular class; it isn't to any particular business; it isn't to industry or avocations, but it is to the citizens and humanity.

"The duty of a state under our great scheme of American government is to respect and sustain every power granted to the United States government and refrain from encroachment upon that granted power or any effort to in any way weaken it. It is then the duty with the remaining power it possesses to exercise it well in an effort to give just, orderly government to all the people of the state. There should be no hostility in the execution and administration of the laws to any class group, but the state should rise above all class distinction, and undertake to establish

and administer a standard of government so just, so wise, as to command the loyalty and support of every citizen, regardless of the class grouping to which he may belong.

"The greatest threat to good government in this republic today, and in the states which make it up, is that our people tend to dissolve into class groups and impure class selfishness, struggle for class advantage and class opportunity, and in our devotion to class, in our devotion to class groups, we are growing rapidly to a forgetfulness of the supreme truth that every American citizen ought to hold his citizenship and the great precious principles which it ought to symbolize above any class or material interest upon the earth.

"And then, whatever rules of conduct are set up for the citizens, whatever the laws, the crystallized will and judgment of the majority of freemen, the government ought to make all the people conform to those standards and respect these rules of conduct. No class has a right to defy the law, and any class who flaunts the flag of defiance and asserts the right to defy the law ought to be brought to submission and order by all the forces of civilization, if necessary. The question which I deem most pertinent for our consideration today is the specific question growing out of the fact that the law ought to be upheld and that mob law, violence and intimidation ought not to be allowed in any civilized state in this commonwealth of states.

"I believe that the greatest danger to good government in this republic today is the threat of organized groups to defy the police power of the government and establish their will as the law of the land. It must not be permitted. The law ought to be just, it ought to be free of class favor and class injustice, but when established it ought to be enforced justly and without discrimination against any class and the most despised class is entitled to protection of the law, and the generous exercise of the police powers of the government when necessary for its enforcement.

"Industrial relations of this country is a mighty touchy subject, and we politicians are scared to death of it, but the hour has come in this republic when we must speak out. I believe in the right of men to bargain in freedom, individually or collectively, provided they can find anybody else, without intimidation and violence, willing to bargain with them. The state ought to stand for the absolute liberty of the citizen to bargain about his labor as he sees fit to bargain and associate himself, if he wants to, with other people, to contract about his labor, but that same principle of freedom requires that the employers shall live in freedom and contract. I believe that the principle of freedom is as sacred to the employer of labor as to the laborer, and whenever the hour comes that the state does not recognize the right of the managers of its industries and the employers of labor to contract or not contract—even when not contracting is a foolish thing—it is the beginning of the end of liberty in this free country and the establishment of autocratic despotic socialism.

"The right to contract or not contract is a basic principle of human liberty, and whenever a man does not want to contract and he won't contract, has a crowd, a great army of men, got a right to associate together and throw violence and intimidation around that free citizen and make him contract or mob him? If that is true then our boasted liberty is a joke, and a lie. I believe in according to labor individually or collectively every right which it enjoys under the great basic principles of American constitutional government, but whenever labor loses its head and mistakes class for country, mistakes class ambition for principle and wants to trample upon the right and the liberty of his employer, I believe in a government as swift as lightning exercising all of the organized power of civilization to prevent it.

"If we do not do that, then your other laws will be worthless and this great fabric of industry, greatness, and strength, and power, and glory, will fall and tumble in wreck and ruin, as it has fallen in Russia and other demoralized and law-disregardful countries of the past. I look upon this issue of law enforcement of respect for the orderly decrees of organized society expressed through our free institutions, as the supreme question in American politics today.

"In my judgment the supreme duty of government, the duty which, if not discharged, makes everything else worthless, is to uphold the law against threats and menace and mob violence, I care not how big the flag or what flag may float above it.

"And now I am going to quit that subject, and want you to let me talk to you about the duty of managers of industry to the state—that's the other side of the proposition. There is a woeful failure upon the part of the strongest, most enlightened leaders of our business life to perform their simplest, elementary political duties. The managers of business and all the people should perform their duty as citizens, and if you do not perform your duties, the other folks fighting for class advantage may do you great injustice; if you are merely where you ought to be when the question arises, and participate in the debate, you would furnish enlightenment on the subject that would doubtless result in the defeat of the hostile act of which you complain. My observation is that business men, the people who pay the taxes, the people who have led the country by their genius and initiative and the power of accomplishment in industry, perform their duty as citizens less fully than almost any other class of people.

" 'Oh,' you hear prosperous business men say, 'I don't like politics,' and they hold a contempt for the man who does. That is a great mistake. You ought to perform your duty as citizens, because your interest is greater than anybody else's; you ought to study how to perform your duty and then perform it with activity and diligence. You know what you all ought to do? You ought to get the platform of the political party to which you belong, the plan of organization, and find out how they run a political party, and when the next primary comes around you ought to be on the first seat taking a hand. I expect you'll get beat, but you ought to go as a good sport and as an American citizen, not as a captain of industry, but as a humble citizen, and meet the barber and hack driver, and the mechanic of the lowest skill and capacity, and in the fellowship of American citizenship, come to the American primary and sit and think together what is best for our country.

"Get the rules of the primary and study them, get out and take a hand, and if you get beat, take it good-naturedly, and congratulate your opponents, take it like a good

sport, and come back next time and you may win. You will be looked upon as citizens even if you do have a big cotton mill or a big bank. We ought to perform these elementary political duties.

"I think the second great weakness, after the efforts for class domination and the establishment of class will over the common will, is the indifference of the successful American business man in all the states to the discharge of his simplest duties as a citizen. If you are Republican —you ought to know better, but if you are, be one, fight it out, and if you can, go to your state conventions, and if you aren't too busy, go out to the national convention, take a hand. If you are a Democrat—and some how or other most of our folks down this way are—go to the primary, go to the convention, take a hand, go on up to the highest conventions, follow it out, get on the platform committee if you can, and if you can't, get in with the fellow that beat you, and try to get your principles adopted, because if you get them adopted in the Democratic party, unless they are very radical, they will likely become the law; it will beat having a little farmers' convention, or a laboring men's convention, or a bankers' convention, and passing a lot of wise resolutions that will be published in the newspapers and then forgotten about.

"In conclusion, my countrymen, do not make fun of, or unjustly criticize the fellow who does try to give you a good government when you won't. If you won't have anything to do with it, for God's sake don't sit off and criticize anybody that does. Why, it's hardly respectable these days to be a politician. It is a sort of degredation. 'Oh, yes,' you hear folks say, 'he's a right good fellow, but he's a politician.' What would get the country if somebody didn't help govern it. I know some politicians are selfish, and actually some of them are not as wise as Solomon, but I am here to tell you that some of them are good men, some are unselfish, some of them love their country, some of them have the mental capacity and virtue that would enable them to acquire riches in certain lines of business, and yet, mysteriously, they love their country, they love the great principles of government, and devote their lives to trying to promote human happiness and character. There are some such men."

Governor McLeod Speaks.

At the conclusion of Governor Morrison's remarks, President Hutchison presented Governor Thomas G. McLeod of South Carolina.

Governor McLeod continued in a discussion of the subject assigned for the speakers of the afternoon, interspersing his remarks with ancedotes and witticisms which were well received by the audience. He paid a tribute to the industrial leaders of South Carolina by stating that "in the measures that I have attempted looking toward the upbuilding of our state, I have found the heads of the industrial enterprises of South Carolina generally willing to cooperate and I am glad to say to you that I do know that a great many of them, brainy, energetic business men, are first of all citizens of South Carolina and America and I therefore feel no hesitancy in calling upon them for any assistance that I may need in the general progress of the state."

Touching upon the assigned subject, the Governor said: "My own ideas as to the relation of the state to industrial enterprises are expressed in a very few words. The basic principle of a Democratic government is that every citizen should be protected in the enjoyment of life, liberty and property. Legitimate enterprises do not ask for favoritism. They do ask that they shall not be discriminated against. The ideal expression of any democracy toward all of its citizens, whether corporate or individual, is that they shall be taxed equitably on an equal distribution of the burden of taxation, and that there shall be no discrimination of one class of citizens against another. I think that in doing that it isn't necessary to get beyond the principles of the democratic government some of us have always tried to observe."

Governor McLeod also mentioned the duty of the business man to the state. "I was glad that Governor Morrison called your attention to what I have often observed," he said, "and that is the failure of some of the best of our citizens to respond to the ordinary duties of a citizen. You remember in the Old Testament the little Hebrew girl said to Naman, 'My Father, if the prophet had told thee to do some great thing, wouldst thou not have done it?' As Governor Morrison was telling you of some of the elementary duties, I thought of that saying. I tell you there is not any duty of the citizen so small that it does not justify any man in this audience leaving his business for the time being. Where is the very bulwark of our liberty? It is in the court-room, in the jury-box, and that country is going to be best governed and the liberty of that people is going to be best preserved where mill owner, banker, and merchant sits side by side with blacksmith or farmer and passes upon the rights of the most insignificant citizen. I have one record that I am proud of, and that is the fact that I have never missed a Democratic club meeting in my life; I have never missed voting in any kind of election that has come up since I was twenty-one years old, and I never expect to. It is the glorious privilege of an American citizen.

"In trying to run our government, the best thing I think we can do is to go back to first principles. There are certain fundamental principles upon which our liberty rests, and we can never fail to observe them and every attempt to violate them or to get beyond them is to get that much beyond the preservation of our individual liberty."

After all, continued the Governor, the business of cotton manufacturing is a return to first principles, and represents the application of modern ideas to basic principles. So it is with the general principles of the government.

In the closing part of his address, Governor McLeod made an appeal for consideration of the farmer on the part of the cotton manufacturer. "He is your partner in business," he said, "and I want to invite for your partner your careful sympathy and cooperation in a movement not to control the price, but to realize a living profit and to feel and realize that your interests are indissolubly connected with his and that the future of your enterprise and industry depends upon the degree of prosperity which he entertains."

The Governor entered into a tirade against the present system of marketing. "There is something woefully wrong; there is something that demands your careful study as great economists in any system that can multiply in exchange any crop or any necessity to the extent that the New York and New Orleans Cotton Exchanges have multiplied the

sales of cotton that have gone from there," he said. Pointing out the advantages of cooperative marketing, he said, "if Carnegie had controlled the cotton-producing interests of the country as he controlled the production of steel, or Swift and Armour as they control the packing houses, would cotton be in any danger of being produced at a loss?"

He then urged cooperative marketing as the solution to the farmer's problem, describing conditions he had seen which were the result of unorganized marketing systems, and declaring that the farmer is entitled to a cost-plus-a-reasonable-profit price for his cotton just as the producer of any other commodity of commerce is entitled to this.

The Convention Banquet.

At the annual banquet, held Wednesday evening at 7.30 o'clock at the Jefferson Hotel, it was necessary to limit the number of admissions to the capacity of the hall, because of the unusually large demand for tickets. Three distinguished speakers were on the program of the affair, at which President C. E. Hutchison was toastmaster. Robert Amory, president of the National Association of Cotton Manufacturers, Governor E. Lee Trinkle of Virginia, and Edward James Cattell of Philadelphia were the speakers.

A delightful program of entertainment had been provided for the banquet by the Richmond committee, including some "Gallagher and Shean" parodies on prominent personages in the industry. Following this entertainment, the toastmaster presented Mr. Amory, who, with Secretary Harry C. Meserve, attended the convention representing the National Association. Mr. Amory addressed the southern mill men as "fellow members of the American Cotton Manufacturers' Association," declaring that he was present as a member of that body, although it was "by virtue of my office in the National Association of Cotton Manufacturers that I have the honor and privilege of speaking to you. Last month," he said, "the National Association at our convention in Providence had the pleasure of Mr. Hutchison's presence. I cannot adequately tell you how delighted were our members that he had taken the trouble to come nor how much impressed and pleased they were to hear from him.

"The cotton mills of the American Association are one of the great wonders of this age," continued Mr. Amory. "Lancashire, England, is the world's greatest cotton manufacturing district. New England is the second. In practically one generation the third greatest district has almost leaped into full manhood. Many of you gentlemen here tonight have been at the helm of your respective mills through the whole period. The great Piedmont district is not only the third greatest district in respect to spindles, but its production in yarns and spindle hours is now actually greater than that of New England.

"In order to judge the future it is well to know something of the past. It is important to understand that the Piedmont cotton mills grew from the efforts of their own districts. They were not built by outside capital or by distant managements. D. A. Tompkin's life ideal of a great cotton manufacturing district has been realized and more than realized. He knew how hard it was for the cotton farmers of the Piedmont district to exist at all. His idea to increase the price of cotton by adding labor to it and selling it in the form of cloth succeeded far better than anyone could have foreseen. The Piedmont section is a great and living example of the value of industries and individual initiative to a community and to civilization.

"Stop and look at this development. Many of you here can do it without having to read it in any other book than your own memories. First, a poverty stricken farming community largely dependent on cotton, of which there was more supply than demand. Between 1885 and 1900 each little town suddenly became possessed of an intense desire to have a cotton mill. Out of the meager savings of the whole population, and where there was no cash by pledges of individual credit, money was collected and mills were built. Some of the poor families went to work in the mills and many of them or their sons now manage mills. Many of them are here in this room. Others of the farmers continued to raise cotton but the increased demand for the staple made it possible to do so at a profit. They could also diversify their crops and have a market for food crops in the mill towns. As the mills grew so did the towns. Money came pouring into the district and outside capital was offered. Allied and dependent industries sprang up. Roads, buildings, houses, schools—all the fruit of the cotton mill.

"Isn't it a wonderful lesson as to what individual initiative almost entirely unaided from outside can do with a great section? You had one advantage; the whole community knew what life without industries meant in that section and everyone helped you. There was a real desire to work and legislation was shaped to build up industries, not to burden them. You gentlemen had to manage mills while learning to run them. You certainly accomplished wonders on the technical end. I will pass over that side of it, not lightly, but for lack of time.

"Your greatest accomplishment is not the mills themselves; it is the industrial community or section that you have developed and the sound common sense that you have kept and instilled in all your neighbors and operatives. You were aided by starting as a farming section and you have not lost the sound economic point of view of the farmer, but have improved it. A group of farmers know the real value of work and the impossibility of living without hard work. They know the value of the things they buy and the things they sell measured in 'man-hours,' or in other words, in terms of work. The fact that the Piedmont section grew because each town wanted a mill has kept the mills scattered over a large area and largely prevented too much crowding into great cities. The mill towns are scattered among the farms and the farms among the mill towns. Each has its influence on the other. It is easier, therefore, for your operatives to realize that a certain number of yards of cloth can be exchanged for a certain number of pounds of cotton or bushels of corn and that lessening the number of yards of cloth produced will react on the operative himself.

"You deserve immense credit for the way in which you have spread these homely gospels among your workers. You have been willing and able to talk to them. Trained in a section where eloquence is a virtue and an art you have used it to spread common sense and practical examples of economic law. We of New England have lacked this ability to talk and have perhaps suffered somewhat from our general custom of silence. We have left the talking too much to demagogues or others who have had no experience

in either industry or farming. These expect industry to be managed by a mysterious something that they call government as if the burden of anything done by government did not fall alike on all workers whether in mills or on farms.

"There is the great lesson of the Piedmont mills building up a great and prosperous territory both for farmer and worker, unhampered by legislation or theories. Compare this lesson for a moment with the reverse of the picture. Another great farming district with not a few mills —Russia tries the theories of Karl Marx, suppresses the individual and runs industry through government. Last year hundreds of thousands, even millions starved. Today crops are good and bread sells for a half a cent a loaf, but cotton cloth costs much more than it does here, both measured in United States money. The farmer in Russia has to pay a tremendous number of bushels of wheat for a piece of cloth. His purchasing power is practically nothing. The worker in the Russian mills cannot possibly get enough to eat for industry is so inefficient that he cannot turn out even the few high priced yards of cloth that are necessary for an exchange with the farmer. In time doubtless, after much more suffering, the Russian community will appreciate the value of unhampered private business and industry will begin to build up again in the only way in which it can be built. The industrial fabric is a delicate one and once destroyed it is a long, long process to recreate.

"Now a word or two about the southern competition, so often referred to in the papers. The talk about it has one advantage in that it has caused many New England mill men to come down here and is resulting in a better acquaintance between the sections. You must appreciate that in Massachusetts, particularly, we are operating our mills under seventeen different restrictive laws which is certainly a very considerable handicap. Put yourself for a moment in the place of the Massachusetts mill man and realize how envious you would be of the great freedom and opportunity of your Piedmont district. Do you realize that a Massachusetts law prevents even the operation of two 48-hour shifts where women are employed, becasue women cannot be employed before 6 a. m. or after 6 p. m? The other New England states are far better off in these respects than Massachusetts.

"Do not think for a moment that all these New England mills are going to move down here. In the first place too rapid growth would not be wholesome for the Piedmont section. In the second place it is expensive and almost impossible to move a cotton mill. The New England mills were built at low cost compared with those built in the last few years. This low cost of plant and low capitalization coupled with a good, liquid asset position due to years of thrift make it possible for them to compete most of the time. You gentlemen here well know what an advantage there is in being able to operate your mills a greater number of hours per week. You know that many of the other so-called advantages amount to very little. For instance that of being near the cotton fields. Many, if not most of the Piedmont mills use cotton from some distance and many pay practically as much freight on cotton as do the New England mills. Long hauls on cotton are nearly as cheap as the short hauls, and where you use western cotton —and many of you do—it must travel all rail, while New England can get hers from Galveston or New Orleans by water.

"I cannot emphasize enough that your greatest advantage is the goodwill of the citizens of your respective states and their sound appreciation of and encouragement to industry. This attitude is reflected in the feelings of your legislatures toward your mills. The lack of this feeling of goodwill and encouragement toward the New England mills is their principal if not their only handicap. I have a feeling, perhaps it is only a hope, that the tide is turning and that soon our New England legislatures will really try to encourage and foster industry. There are distinct signs of this in some of the states. But until this occurs there will be few if any new cotton mills built in New England.

"The high cost of new mills built today outside of New England is a distinct advantage to her low capitalized mills in competition. The principal effect of her burdensome laws on her present mills will be more or less irregular operation. This will occur because her higher cost of manufacturing makes it unsafe for her to stock goods in times of falling prices. By these curtailments the mills will also save losses, but it cannot help being felt by the operatives and stores in the various mill towns. You can see this curtailment actually occurring today in several places, principally in Massachusetts.

"I cannot speak highly enough of the courtesy, consideration and cooperation displayed by the officers of your Association toward our National Association. As we meet them on the National Council of American Cotton Manufacturers, we are more and more impressed by the broad-minded qualities of your leaders. It augurs well for the future of our industry when harmony such as this prevails. Such cooperation is not easy in an industry so highly competitive as ours for such competition easily gives rise to hard feelings. It is only by a policy of give and take and by mutual acquaintance and confidence that friction can be avoided. Your officers and members of the National Council have set such a high standard in their relations with the members from our National Association that it is difficult if not impossible to match them. I know that they are working for the good of the whole cotton manufacturing industry and not just one particular section, and I feel that they know we are trying our best to follow that same splendid broad-minded attitude.

"In closing, I want to thank you for your hospitality and to say that the office of the National Association of Cotton Manufacturers at 45 Milk Street, Boston, always has its door open to any of you. You will not only be welcome at any of our conventions but we urge you with all our power to come to them and be one of us."

Following Mr. Amory, President Hutchison introduced Governor E. Lee Trinkle, who spoke interestingly of the history and traditions of Virginia, and who was followed by Edward James Cattell, of Philadelphia, internationally famous after-dinner speaker, who added humor, pathos, and good, sound philosophy to the occasion in a most interesting address. Mr. Cattell was the final speaker at the banquet.

The Thursday Morning Session

convened at 10 o'clock, and the first feature was a talk by Dr. Paul Smith, who, speaking for William H. Barr, president of the National Founders Association outlined an

organization to be known as the American Motion Picture Corporation, which will distribute a weekly film service to be used in churches, schools and industrial plants as an educational plan. On motion of Captain Smyth, it was voted to endorse the plan and urge the members to encourage the enterprise and become stockholders in it.

The convention then went into business session and received the reports of officers and committees, the first being reports of Secretary-Treasurer Winston D. Adams.

Mr. Adam's report as secretary was devoted to certain phases of the enlarged service undertaken through his office. Important among these was the effort put forth to correctly inform the public as to the true facts of the southern textile situation and conditions. A comprehensive campaign, under the direction of the National Committee, was inaugurated, and Mr. Adams, working with the committee, reported the preparation and publication of many articles dealing with particular phases of this development; as well as numbers of letters written to leading authorities correcting misleading or erroneous statements as to wages, hours, working conditions, etc.

Another matter to which the association has given consideration, reported Mr. Adams, has been the agitation looking to the transfer of activities of New England corporations to the southern field, with particular reference to the effect of such movement on present labor conditions and the future labor supply. However that may be, he said, the members were solidly opposed to any influx of northern labor of foreign extraction, and while outsiders are welcome in the extension of the southern textile industry within the limitations of the natural labor supply, any disposition to bring in outside operatives would be vigorously and actively resented. Mr. Adams also reported closer cooperation and interrelated activity with the various state associations during the year.

Stuart W. Cramer, chairman of the national committee, and joint chairman of the National Council of American Cotton Manufacturers, made his reports, indicating active work of these two bodies during the year. In connection with the Fordney-McCumber tariff bill, Mr. Cramer presented a resolution with special consent of the resolutions committee.

"The yarn spinners of this Association," said Mr. Cramer, "who comprise nearly one-half of its membership, will be interested to know that the traditional policy maintained by this association for a dozen years or more was adopted by Congress and is now a part of the tariff law. A dozen years ago your tariff and legislative committee succeeded in obtaining, for the first time, suitable recognition in the tariff laws for advanced cotton yarns; the same parity of rates for advanced cotton yarns and plain cloths was conceded in the Underwood-Simmons Tariff Act, and is now also a part of the Fordney-McCumber Tariff Law, so that this question is removed as a political issue and has been adopted as a part of the tariff policy of both the Republican and the Democratic parties."

In the new tariff bill, which is now in force there is a provision authorizing the president, under certain conditions, to change the rates of tariff duties, explained Mr. Cramer, and as was to be expected, there are many who have promptly availed themselves of the opportunity to agitate this question. Mr. Cramer expressed it as the feeling of the members that such agitation should be limited to the least possible extent compatible with the spirit and intent of the law, and offered a resolution whereby the Association "enters its protest against further tariff agitation that is not only clearly unnecessary, but that would tend to disrupt business conditions," and that "it is the conviction of this association that investigations should be made only on direct and specific petitions or applications for relief." This resolution was unanimously adopted.

The reports of George W. Forrester, traffic manager, and Augustus W. Smith, were next made, Mr. Forrester reporting for the traffic committee, and Mr. Smith making the report of the committee on foreign trade, of which he is the chairman.

D. M. Jones, of Gastonia, N. C., reported as chairman of a special committee considering the Fulmer Act, or, as it is designated, "The United States Cotton Standards Act." This Act, said Mr. Jones, is intended to promote the use of the United States standards for grade and length not only in domestic or interstate commerce, but to force foreign countries to adopt them.

"There are only two sections that will interest you, in fact the entire act is worthless insofar as it will help the cotton planter or the manufacturer," said Mr. Jones. "These two sections are sections three and four. The balance of the act deals with its application and penalties.

"Now if I am correctly informed, representatives of the Agricultural Department were in Liverpool last summer, and while there tried to get the Liverpool Cotton Association to adopt our standards. This they refused to do and as a result we have the Fulmer Act to compel them to whether they wish it or not.

"Unquestionably the Liverpool Cotton Association was right in their refusal, for our standards mean but little, if anything, as the Agricultural Department seems to have the privilege or right to arbitrarily change the grade types or boxes from year to year as conditions may make a low or high grade crop. For fifty years or more we had a grade known as strict middling, and anyone who knew anything about cotton knew that grade but when the Department of Agriculture took a hand they immediately decided that what we had been calling strict middling was altogether too high in grade so they made up their type which showed more leaf and more color and called it strict middling when it was really nothing but middling cotton and as a result the mills using strict middling cotton will have to buy Government box good middling in order to get the same character of yarn or cloth they made before this Government grade was introduced, or buy on the old classification, which the Fulmer Act now says that we shall not do. On the other hand, the Liverpool grades were established long before ours and to the best of my information have always remained the same.

"Just whom the gentlemen in the department think they are benefitting I am at a loss to know. It certainly is not the planter who raises the cotton or the manufacturer who spins it into yarn. A very large part of the crop is bought from the farmers' wagons where neither grade nor staple is mentioned, but he is offered so much per pound for the bale, just as the buyer finds it, and I would like to say right here that the great majority of planters know just what length cotton they have, and have a very fair idea as to the

grade, and in my humble opinion he is damaged far more in the restriction of foreign trade which this act will cause than the gentlemen who fathered the bill ever anticipated, for the act will practically cut out the small exporter and throw all the business into the hands of a few large exporters, although they would rather have it otherwise, as they realize that it is totally unfair.

"Section 3 of the Act empowers the Secretary of Agriculture to issue license to any person who he may think is competent to grade or otherwise classify cotton, but this section amounts to but little except to replenish the pork barrel, which it will undoubtedly do in years to come if this Act remains in force.

"Section 4, however, is of vital consequence to the manufacturer as it provides that any person who has custody of or financial interest in a lot of cotton may submit the samples if drawn in accordance with the regulations of the Secretary of Agriculture to such officer or officers of the Department as may be designated for a true determination of the classification of such cotton. The department can then issue what they call a final certificate showing such determination and which is binding on officers of the United States as prima facie evidence of the true classification of such cotton when involved in any transaction or shipment in commerce.

"In other words, should any of you manufacturers make a purchase of a hundred bales of cotton from a shipper in Memphis, New Orleans or New York and that shipper held a final certificate from the Department of Agriculture, all that he would have to do would be to have the cotton exchange in such place superintend the shipping of the cotton, viz., see that the cotton called for by the certificate went out under proper railroad seals and that it arrived at its destination without these seals broken, and if it arrived under proper seals the cotton belonged to the mill without recourse. But just how many of you gentlemen are ready for the government to class your cotton, I don't know; but I for one am not.

"I think that I have about covered the most important and dangerous parts of the Act but before I close I would like to say a word along another line, and I am now speaking as manager of a very small mill. I want to say that if something is not done to curb the activities of the Department of Agriculture most of us will live to see both the cotton planter and manufacturer go on the rocks good and hard.

"I have talked with a great many men who were either planters or manufacturers in regard to what might be done to protect ourselves against the interference of the Department of Agriculture in matters wholly outside of their jurisdiction.

"All to whom I talked were of the opinion that something should be done, but they believed we are helpless.

"Now if you will recall a few years back when some of our prominent shippers and operators almost met disaster on the bear side of the market, they promptly called on the Attorney General of the United States, and he just as promptly showed the bull operators where they got off. But there does not seem to be any law that will reach the gambler on the bear side of the market. He is at liberty to sell ten crops in one if he feels so inclined and should the market go against him, like the poor loser in a poker game, he calls the police and the matter is settled.

"Each year finds some new report or estimate that in most cases is squarely against the interests of the planters and the manufacturers, who should be the first people considered, and directly in the interest of the gambler.

"The latest report introduced is known as the Farmers' Intent Report, which came out on the 21st of April and gave an increase in acreage of 12 per cent, which meant that there would probably be planted nearly 39,000,000 acres in cotton this year. Last year the Department attempted to guess the number of acres planted as of June 25 and missed it several million acres, and at that time planting was over. Now, with not more than 25 per cent of the cotton planted, they attempt another guess, which anyone with the least bit of common sense will know is far from what the actual figures will finally show. This absurd guess was made in the face of the facts with which the Department employees should have been familiar, viz., a very late spring attended by heavy rains which retarded planting and a great scarcity of farm labor east of the Mississippi river.

"The result of broadcasting this unexpected report was an immediate and heavy decline in the cotton market and a further slowing up in the manufacturing of cotton which was already having a hard fight against propagandists of all kinds. This decline meant the loss of millions of dollars to the farmers and manufacturers and undermined and destroyed a very healthy condition in both industries. But 'it's an ill wind that blows nobody good,' and the gambler in cotton futures benefitted to the extent of many millions of dollars by the fall in the price of cotton due directly to the 'Farmers' Intent Report.' "

Following Mr. Jones' report, Allen F. Johnson pointed out a discrepancy of approximately 2,000,000 bales as given in the respective estimates of the world's probable carry-over of the Department of Agriculture and the Bureau of Census of the Department of Commerce.

Having received special consent to speak as a non-member of the Association, W. R. Meadows, of the Department of Agriculture, spoke with reference to the two criticisms made concerning the government agencies. He said first of all that the Department of Agriculture's Farmers' Intent Report was issued over his own protest, as he did not consider it accurate, and that, through his chief, he had been relieved of all responsibility in connection with it. It was issued through the section of crop estimates, in the same department with which he is connected. "It is true," said Mr. Meadows, "that the Department of Agriculture made a report on the 20th of April which showed an intended planting of 12 per cent increase, and on the following day a different committee came to Washington and issued another report which showed that the consumption of cotton would be 13,000,000 bales and that at the end of the season there would be approximately 6,850,000 bales as compared with 7,800,000 bales a year previous. I cannot give you the authority for these figures, but in my judgment they certainly contained an error of more than 2,000,000 bales as to the carry-over." He said he had assisted in the compilation of the Department of Commerce report and believed that to be nearer the facts in the case, although there were several factors such as stocks in hand in certain foreign countries that deserved careful consideration.

(*Continued on page 721.*)

Georgia Manufacturers' Association

Giving consideration to the important question of taxation, and discussing the inter-relation and inter-dependence of manufacturing and agriculture in the state's progress, the speakers at the annual convention of the Georgia Manufacturers' Association, held at the Piedmont Hotel, Atlanta, Ga., on May 10, made the meeting one of interest not only to the manufacturers of Georgia, but to those of other states as well.

Another feature of the meeting was a discussion of the means or preparation, so to speak, in attracting additional development of industrials in the State, and the necessity for making satisfactory and equitable conditions for new enterprises of a manufacturing character considering the establishment of plants in the State. The measures recommended in all of the addresses, as a whole, were of such a nature that they apply to other parts of the South, thus giving the meeting interest beyond the limits of Georgia.

W. B. Baker, president of the Atlantic Ice and Coal Corporation, Atlanta, who is president of the Association, was the presiding officer of the convention. The first speaker introduced by Mr. Baker was George Betts, of Ashburn, Ga., president of the Georgia Association.

The theme of Mr. Betts' remarks was the need for intelligent diversification in farming in Georgia, and the advantages that might accrue to industry through the proper direction of effort in this connection. He stated that while manufacturers, at first blush, might feel that agriculture was a trouble not their own, he believed that one of the causes for the condition existing among the farmers was the fact that business men generally have not recognized that it is their problem. He further stated that the future progress of industry in the State was predicated to a large extent upon the development of the agricultural man; and that the responsibility of remedying the farmer's condition rests chiefly with the business man. Basing his statement upon the surmise that a large percentage of his hearers represented industry and that these men were also interested in the banks of the State, he indicated that the key to the situation was, to a large measure, in their hands.

The speaker then began to paint a picture of the agricultural conditions in Georgia, declaring that the situation was not new, that it had existed for fifty years, and was growing worse, affecting business and threatening ruin. Mr. Betts then cited evidence of the doubt which he expressed that the majority of the people of the State were not agreed to the slogan, "It's great to be a Georgian." That is a fine statement, he said, and beautiful sentiment, but he pointed out examples of unfortunate living conditions on farms over the State that prevented the farm people from subscribing to the statement. "Out of the three million people in the State," he said, "I think I know of some two million who do not agree with the sentiment expressed in that slogan; I am speaking of the farm population. The evidence of it is that they are trying to leave their homes.

"You would think that the negro, native in Georgia, knowing nothing else but Georgia, being told all his life that this is the country for him, would feel that it is great to be a Georgian, but the evidence that they do not think so is found in the fact that they are leaving Georgia as fast as they can be furnished railroad fare. According to the statistics of the State Board of Agriculture, 22,000 negroes left Georgia within a recent twelve-months period."

Mr. Betts pointed out that there seems to be a movement from the farm to the town and city—from agriculture to industry, with boys "in the small towns milking soda fountains instead being on the farm milking cows." He cited that on farms he had seen eight- nine- and ten-year old white boys and girls working in the fields, chopping cotton, living in hovels. Pointing out the relation between the farm and industry, he declared that if this condition continues, it will be only a matter of time until industry feels it, "because agriculture is industry's biggest consumer."

PRESIDENT W. B. BAKER.

In further presenting his picture of farming conditions in Georgia, Mr. Betts stated that, with 73 per cent of the population living on the farms, there are 316,000 farms in the State, more than any other State except Texas; 116,000 more than all of New England combined. And yet, he declared, 115,000 of these farms have no cows on them; 182,000 of them have no brooding sows; 32,000 have no fowl of any kind. He said that the average income of the Georgia farmer is $315 against $1,200 to $1,300 for the farmer north of the Ohio river. Georgia, he said contains more tenant farmers than any other State in the union; Georgia imports $100,000,000 worth of foodstuffs into the state every year.

The wholesale practice of dairy farming, said Mr. Betts, would solve the problem faced by the farmer. When the

prices of dairy products are at their highest point, he said, the northern and middle western states produce their smallest output, while, due to favorable climatic conditions, Georgia is in a position to supply a large production of these products when the selling prices are at the peak.

In support of his argument for the adoption of dairy farming, Mr. Betts quoted the Federal Reserve Board as reporting that the only sections in the country that were normally prosperous after the deflation period were the dairy sections; he quoted the Southern Railway as stating that the most prosperous sections on their road were the dairy sections; and cited the contrast in land values between Georgia and Wisconsin, the latter being a dairy-product state.

Dairy farming, with cooperative marketing organizations, would be the salvation of the Georgia farmer, said Mr. Betts. Under the present conditions, however, the Georgia farmer cannot sell his product through the cooperative marketing organization, said the speaker. He cited instances showing that the average Georgia farmer has paid as much as $14.36 a ton extra when purchasing fertilizer on time, instead of paying cash. As another millstone around his neck, continued the speaker, the farmer doing his trading on time at the time supply store pays from 30 to 50 per cent interest for the credit he gets.

Drawing the picture of the 315,000 farms in Georgia converted into 315,000 factories, each, with its dairy cows and hogs and hens, manufacturing the raw material into the finished product, Mr. Betts declared that dairy farming would help to enable the Georgia people to keep within the state the $100,000,000 being sent out now for foodstuffs, and turn it into the banks and industries of the state. It would, he said, allow the farmer to keep out of the "time" supply store and pay for his fertilizer with cash; would allow him to begin to realize his dream of putting his children in school, his boys in college, and realize a profit on his farm.

When there is a profit on the farm, said Mr. Betts, the people of the rural district will see the possibilities in it, and would be potential land buyers instead of tenants. It will be necessary, however, for the bankers over the state to extend credit that will allow the farmer to go into the dairy field, continued the speaker, and said he felt that any cooperation lent in this manner would redound to the banker and the business man manyfold.

At the conclusion of Mr. Betts' remarks, President Baker cited instances where diversified farming in Georgia has really paid.

Hon. Walter F. George, junior United States Senator from Georgia, was next introduced by Mr. Baker. Senator George also discussed the interdependence of agriculture and industry, but approached the subject from the opposite angle to that discussed by Mr. Betts, declaring that the solution of the farmer's plight lies in the establishment of factories with their centers of non-producers of agriculture who can consume the products of the state.

Senator George said he had heard a great deal about the best methods of solving the farmer's needs; that he needed a separate system of credit; that he should have a reduction in transportation rates; that cooperative marketing would lift him out of the slough of despair. The speaker conceded the truth of all of these suggestions, if properly carried out, but—

"When you combine all of these suggestions—credits, reduced transportation, and better marketing systems, and when you add diversification, which has been impressed upon us so strongly, you are still confronted with a great problem.

"If there is to be diversification in our farming, there must be a basis upon which the farmer can diversify. It is strictly a business proposition. It would hardly commend itself to any of you gentlemen to split up your enterprise and manufacture a whole lot of dissimilar things; though you might manufacture things that had a striking similarity.

"The same thing is true of agriculture. The farmer must select his soil, build his houses, buy his machinery, and prepare—and I mean permanent preparation—for a particular crop. If he does not he is going to be a failure. If he attempts to prepare a tract of land to meet the conditions of all kinds of crops, he simply cannot do it.

"There ought to be diversification, but before there can be diversification, there must be a condition that permits it, and that brings me up to what I want to say to you.

"I do not believe that Georgia can become supreme economically, industrially and agriculturally, until we have builded industry in the South, and especially in Georgia, and I believe that the hope of Georgia as an agricultural State, the hope of greatness in this State, lies in the building up in Georgia of a coordinated business of industry and manufacturing, and I mean by that simply this: as long as the Georgia farmer is forced to produce his products, whether foodstuffs and supplies or cotton, and must ship these diversified farm products into a far distant center, paying necessarily a large toll to the transportation lines of the country to get his product to some centers of distribution, he will be so handicapped as to make progress along the lines of diversification to any marked degree well nigh impossible.

"In Georgia we have very few large centers of non-producers of agriculture. We have Atlanta, and we have Rome, and Columbus, and Macon, and Savannah and Augusta, a few large centers, but immediately around these particular centers lie agricultural communities which can supply that immediate center and yet not touch the vast body of developed lands in Georgia. We are a long way from the manufacturing centers in the East and in the North and Central West, and it is a long haul for our products to take to get into these centers; they simply cannot get there under advantageous conditions. The hope for diversified farming in Georgia is the building up of centers of non-producers of agriculture, scattered throughout the State, centers that will consume the surplus products from the farm, centers that will consume part of the product in a raw state and make possible the conversion of the raw product into a finished state, and then in that finished state it can be carried into the centers far removed from us and sold.

"New England and the East have long enjoyed a supremacy over other sections of the country, and especially over the South; for more than fifty years this has been so. The foundation of the East's supremacy lies in her industry and its supremacy. For one reason and another the East began early to manufacture, and the East today is making everything from a pin to a locomotive, including everything used in daily household life and the conduct of business.

"Some of the things that made manufacturing possible in

New England not only made it possible but made it imperative. New England and the East had a dense population, a populous settlement, and this furnished an adequate labor supply that could be used in manufacture. Then the immigrant came over, and naturally settled in some of the thickly populated portions of the United States; they came from a congested country and they were unaccustomed to the vast expanses of land sparsely settled such as they heard of in the South, so they naturally settled in the East.

"The East was settled by the English, in a large measure, men who had the trading instinct, and they went naturally into manufacture.

"Ultimately, however," Senator George continued, "the same things that made manufacturing possible earlier in New England and the East began to hamper industry there. The tide of immigration that first came from Northern Europe furnishing skilled labor for the New England mills and industry, shifted to the southern and southeastern portions of Europe and unskilled labor came and it came in such large proportions that finally it was inevitable that industrial troubles arose, industrial difficulties came up, labor legislation that really hampered industry in the East, was put in effect. Whether it was necessary or wise is not a matter that I am discussing, but that legislation hampered industry, for the time being at least, and was the very thing that had made manufacturing possible in New England, and in 1877 the textile mills were started in the South.

"Of course we had some considerable manufacturing in the South prior to the Civil War. We had more manufacturing prior to the Civil War than we now generally think of, but the war stopped it all and we started after the war without manufacturing, without industry, reduced to an agricultural basis, but about 1877 we began to have a few cotton mills in the South, and as soon as the first cotton mill was put up it demonstrated that the South was the best place in which the raw product could be converted into the finished product.

"You may disagree with this statement: The same thing that happened in textiles will happen in every other line of manufacture whenever a great industrial leader comes into the South and demonstrates not only the possibilities of manufacture but the necessity of the other manufacturing plants building plants to compete. That is why textile mills have come to the South. They have not come among us through any particular love of the South, but because they thought that by coming to the South they would necessarily better their conditions. The New England manufacturer was perfectly content to make money up there, even though he had to meet his unfavorable conditions, but when our sipndles began to increase, the New Englander saw that he had to meet the competition, and he said that 'any new spindles we put in will be installed in the South.'

"I need not tell you that now nearly 50 per cent of all the spindles in the United States are in the South; that approximately 86 per cent of the new spindles are being installed in the South as against 15 per cent in all the rest of the country. They were obliged to come here in order to meet competition. Why? Because you have not only waterpower, you have coal, and iron, you have adequate transportation facilities, you have an equitable climate, longer summers and shorter winters, you have living conditions that cannot be duplicated on the continent, and these living conditions are cheaper. You have the raw material at the factory door. Another thing is that the center of population of the United States is shifting. It is getting away from New England and is coming nearer the South; the South is getting close and closer. You have an adequate supply of cheap labor, common labor, and an adequate supply of skilled labor, although industry in the East is drawing this from us until we can produce places in our own industry for them.

"You may expect in 25 to 50 years, when some great industrial leader establishes other industry in the South and brings to the attention of the world what the eastern manufacturer already knows—that in order to meet the competition of the southern industry he has got to get on the field—you will see the same movement to the South in other industries that you see in the textile industry, and then it will be possible for Georgia to be an agricultural state. You will have such large centers of population, and you will have a chain of communities, industrial communities, that can and will absorb the surplus milk and butter and such products. But we must start it, and then the farmer will see that his salvation lies along the lines of diversified farming, and he will find his market, and as soon as he finds his market, he will meet the needs of that market. Not only that, but when industries operate in the South it will bring more energy on the farm; it will stimulate the farmer, and we need that stimulation. We have dropped into that rut from which it is awfully hard to lift out, and we cannot lift ourselves unless trained business and professional men turn their attention to the conditions of the farmer, and unless they realize that they must build up Georgia industrially before they can hope to put the farmer where he should be."

Touching upon the subject of the negro exodus from the South, Senator George said that he believes this exodus has spent itself already; but that "you must expect an exodus until the South develops industrially. When the South commences industrial expansion you can expect a check on the exodus. You have in it your power not merely to bring the industries into the South, but to check and hold in balance the supply of labor under the operation of natural laws, and you have it in your power to make possible a real agricultural development by building up industry."

In connection with the new industries coming into the State, Senator George expressed himself as opposed to the offering of free sites and exemption from taxation for a period of years. "The really worthwhile manufacturer," he said, "is not looking for this. What he wants is a square deal, and fair, just and equitable conditions. I want us to be able to say that we can give him those conditions; to say "Here is our tax system. It is simple and you can work it out, and know what your taxes are going to be. It offers no special favors, but it is as fair as any other State can offer you!"

Concluding his remarks, the senator appealed to the business men to consider the fair, just and sane development of industry in the State as a means for progress and salvation in the condition of the agricultural sections, stating that coordinated industry was vital and necessary in this.

Following Senator George, the chairman presented James A. Hollomon, associate editor of The Atlanta Constitution, who spoke with reference to tax problems in Georgia. Mr. Hollomon recommended a classified property tax for the

state, supplemented by an income tax on incomes with such exemptions as to not burden the wage-earner and small salaried man. This supplementary income levy to apply only to those not on the property tax digests.

At the beginning of his remarks, Mr. Hollomon touched upon the movement of industries into the State. "My observation is that to bring industry into the State, our success depends very largely upon the fixed, stable conditions. The man who is going to establish an industrial plant is not so partirularly concerned about the system of taxation, so it is fair, as he is about the stability of that system. He does not want to come into the State under tax reform or metamorphosis, not knowing what is going to happen to him. He wants a stabilized system of some kind that is fair and just.

"And he is not going to ask for any favors," continued Mr. Hollomon, "if he is the right kind of a man. We hear a great deal about tax exemption for new industries for a period of years. I am here to tell you that in my honest and candid opinion the most radical thing on the top side of God's earth is this thing of tax exemption. Not only that, but there is no industrial group worthwhile that is anticipating moving into a community, who asks for tax exemption, or asks for free sites, or any special favors. What they want is the protection of government, and if they are worth having in your community they are willing to pay for it on a fair basis."

Mr. Hollomon next pointed out the inadequacy of the present Georgia tax system, declaring that it is not only inadequate but is unfair and unjust as well. He stated that at present the Georgia uniform ad valorem system cannot be equitable, showing that assessing property at five mills for the State, ten mills for the county and fifteen mills for the city, as in Fulton, makes three per cent, and declaring that a State of tax liars is being made by the system because it requires among other things, inclusion of personal property and invisible holdings in the assessments, and that a man will not pay three per cent taxes on money for which he is getting only 3½ per cent in the savings department of a bank.

He pointed out further that there are different classes of property, and declared they should be taxed on the basis of the classes. He was very vigorous in his condemnation of the income tax plan, as a tax basis, citing instances in other States where it had failed, and stating it was inequitable in that large capitalists could sink great sums into tax-exempt bonds and thus escape taxation under this plan.

Mr. Hollomon's plea was for a reduced tax burden, declaring that it would give the State a greater revenue through taxing property on a classified basis, and providing an income tax only for those who would not be reached in any other manner, providing a preventive of double taxation also. This, he said, would distribute the tax over all the people and make everybody pay his share. "My proposition," he said, "is that you reduce the real estate rate to 2.5 or 3 mills and bring it right down to meet your intangible property tax rate of 1.5 mills, or less."

Mr. Hollomon declared that the biggest factor contributing to the instability of the present taxation system, and one that should be abolished, is the county systems. He said that in the State there is only a sky-limit on the local board. He said he knew of an instance where county commissioners had laid out a school district within the limits of the property of a manufacturing plant, so that the mill had to pay the entire tax; another case cited was that of another county which plotted a district along the right of way of 75 miles of railroad, making the district a mile wide and 35 miles long, so that the utility men would have to pay the tax. Regardless of whether there were objections in the individual cases affected, Mr. Hollomon argued, the principle of the system was unfair and unjust, and should be corrected. He told another instance of a county forming a district and bonding it for eight per cent of its valuation, and then assessing one concern of that district for a levy sufficient to retire the bonds and help maintain the school.

At 12:45 o'clock the delegates to the convention were served a delightful luncheon in the main dining room of the hotel, following which they returned to the meeting hall for the afternoon session, at which they were addressed by W. P. Lemon, of the Georgia Forestry Association, and Fort E. Land, director for the State Board of Vocational Education. Mr. Lemon painted the picture of the depleted condition of the forest lands in this section, and in pointing out the direct relation between the need for a sufficient timber supply and the different types of business activity, urged the business men to give their close cooperation to the movement for the conservation of forest land.

Mr. Land, continuing in the vein of the speakers of the morning, pointed out that another attribute for attracting industries to the State was trained men, and outlined the activity of his organization in assisting in the work of equipping men for industry.

Following Mr. Land's remarks, the convention went into executive session, and in the election of officers, Mr. Baker was re-elected president for another year, and W. J. Pierpont, of Savannah, and W. J. Vereen, president of the Moultrie (Ga.) Cotton Mills, and F. B. Gordon, president of the Columbus (Ga.) Manufacturing Company, were re-elected vice-presidents. Robert S. Parker, of Atlanta, was re-elected general counsel of the association, and Robert Gregg, of Atlanta, was elected as a member of the board of governors.

A resolution, calling upon the people of Georgia, and the South generally, and to the manufacturers of the State in particular, to use their efforts in checking the migration of negroes to the North, was adopted. A survey of conditions existing among the southern negroes who have migrated to the North, it was pointed out, shows conclusively that the negro in the North "is a stranger in a foreign land," away from the people who understand him best; unadapted to the rigors of the northern winter. It was also pointed out that negro migration depletes the labor supply of the South and thus causes a serious economic loss.

A booklet descriptive of their friction pulleys and patent whip hoists has been issued by Volney W. Mason & Co., Providence, R. I. This concern began the manufacture of friction pulleys and clutches over sixty years ago, and the patent whip hoists were developed in 1888. The use of friction pulleys and clutches, it is pointed out, allows lines of shafting or machines to be instantly or gradually stopped, started or disconnected, and the shifting of the belts from tight to loose pulleys eliminated. Economical handling and distribution are pointed out as features of whip hoist installations.

Cotton Mill Men at Providence

National Association of Cotton Manufacturers Hold Annual Convention Near Birthplace of the Industry in America

BY JAMES ROBERTSON.

Decidedly one of the most comprehensive gatherings of the Association from the standpoint of subjects discussed, and with a most generous supply of entertainment, the 114th annual meeting of the National Association of Cotton Manufacturers, held at the Providence-Biltmore Hotel, Providence, R. I., on April 24, 25, and 26, was accorded a most successful affair by the large group of delegates who were present at the various functions.

Exports, industrial relations, cooperative cotton marketing, textile research and other subjects of vital interest were discussed during the convention. Of particular practical value was the technical section held on Wednesday afternoon, with Henry C. Everett, Jr., as chairman, at which two important subjects were presented in papers and discussed by some of the unusually large number of members who were present. A report of these papers and the discussion which followed their presentation will be found later in this story.

The first session of the convention, which opened Tuesday morning, consisted mainly of routine business, including the reports of the secretary, the treasurer and the various standing committees. Joseph H. Gainer, mayor of Providence, welcomed the members to that city.

Following the presentation of the various reports, President Amory spoke briefly, first urging greater cooperation between the members of the industry; and suggesting that the annual meeting of the association be changed to the fall and that the spring meeting might be dropped altogether.

"This is our sixty-ninth birthday," said Mr. Amory. "The past year shows the strength and vitality of our old but young association. The spirit of our members has given us today the largest meeting the National Association of Cotton Manufacturers has ever had. Mr. Meserve has proved to be a treasure. Little do some of you know how hard he works and with his whole heart. His absolute honesty and sincerity of purpose, coupled with unfailing courtesy and even temper, have had much to do with the success of the association in the past year.

"In an industry such as ours, cooperation through an association is absolutely vital. We must realize that the cotton manufacturing industry is almost, if not quite, alone among the great industries in being divided into many units, no one of which can dominate or even lead. It is safe to say that no one mill or group of mills controls over five per cent of the production of cotton goods. The manufacturing of cotton goods is therefore highly competitive.

"With such intense competition it is important that some of its bitterness be avoided by personal acquaintance through cooperation where possible for the general good of the industry. This cooperation is very difficult to secure and many of us must bury our little hatchets and work hard and pleasantly to accomplish our purpose."

Mr. Amory then urged support of the Association on the part of every eastern cotton mill, that all would join as sustaining members and expressing the hope that the present membership would help to secure the desired result.

"I would suggest that we seriously consider the changing of our annual meeting to the fall," continued Mr. Amory, "and even dropping the spring meeting. We can and should afford time to meet together once in each year, but twice seems to be once too many for many of our busiest men. By concentrating on one meeting and having that in the fall, it is possible for some of us to attend the annual meeting of the American Association, which takes place in the spring. It is also possible for many members of the American Association to attend our fall meeting. A closer acquaintance between the members of the two associations is most desirable, for cooperation is also vital between the two great manufacturing districts."

PRESIDENT ROBERT AMORY.

The second session, held on Tuesday afternoon, at 2:30 o'clock, was divided into two sections, one dealing with the subject of "Export Markets," with George Nichols acting as chairman. The first address in this section was by W. Irving Bullard, treasurer of the Association, who spoke on the possibilities of Brazil as a cotton producer and manufacturer. Mr. Bullard only recently returned from an extended trip to the South American country, where he was the official delegate of the Association at the International Cotton Conference held at Rio de Janeiro last fall. Mr. Bullard's subject was "Brazil—The Promising Land," and his remarks will be found under that heading on another page of this issue.

The other feature of this session was an interesting discussion of "World Markets" by John S. Lawrence, of Lawrence & Company, Boston.

"Industrial Relations" was the theme of the second division of the Tuesday afternoon session, at which Frederick S. Sibley, vice president of the Rhode Island Hospital Trust Co., of Providence, spoke on the subject "The Human Element the Most Neglected Factor in Industry," and John Calder, industrial engineer, discussed the subject of industrial relations, presenting suggestions as to how the problem should be approached and solved. He said that the main things required by a worker are: a steady job, adequate real wages in things, a good supervisor, and an individual and collective voice in working conditions.

A "smoker" constituted the third session of the convention. This was arranged under the direction of the smoker committee of which Philip C. Wentworth was chairman.

Election of officers and other business was transacted at the fourth session, on Wednesday morning, at which the following report of the nominating committee was read and the following officers unanimously elected:

President, Robert Amory; senior vice president, Nathan Durfee; junior vice president, John Skinner.

Directors for one year: J. Arthur Atwood, Morgan Butler, A. W. Dimick, B. H. Bristow Draper and Charles M. Holmes. Directors for three years: Arthur R. Dickinson, R. H. I. Goddard, Russell H. Leonard, John A. Sweetser and Andrew S. Webb. The following five directors continue in office: A. E. Colby, Philip Dana, Lewis Dexter, John A. Perkins and James Thompson.

The subjects of "Cooperative Movements" and "Cotton Marketing" were respectively discussed by A. H. Stone, vice president of the Staple Cotton Cooperative Association, of Greenwood, Miss., and W. L. Clayton, of Anderson, Clayton & Company.

The Technical Session

was held on Wednesday afternoon, with Henry C. Everett, Jr., as chairman.

Mr. Everett in his opening remarks, pointed out the vital importance of research work in connection with the present day cotton manufacturing trade. Since competition these days is so keen it is necessary for the latest ideas and developments to be undertaken. The vital factors in the success of research lie in the enthusiasm and accord granted to it by the mill managements, and the cooperation that is advanced in the matter of the practical application of the facts found by such research all the way from the president and agent down to the overseer and operative.

Arthur N. Sheldon of the F. B. Sheldon Co., of Providence, R. I. was then introduced as the first speaker and he read the following interesting development of

Some Experiments in Four Roll Drafting Applied to Slubber and Roving Frames.

This paper which was contributed by the Textile Division of the American Society of Mechanical Engineers, follows:

"During the past two years we have developed in our cotton research laboratory a system of four roll drafting on slubbers and roving frames which has produced some results and suggested some possibilities that are interesting.

"Our tests were made on an ordinary slubber and roving frame equipped with a set of four steel rolls instead of three, the slubber making a bobbin 9 x 4½ inches and the roving frame a bobbin 7 x 3½ inches. The spinning frame was of a standard make with three steel rolls and the usual leather-covered rolls. Atmospheric conditions were maintained at a constant temperature and humidity by means of automatic control. The strength of yarn was tested in single strands on a motor driven Scott single yarn tester of 48 ounce capacity. The skein breaks were made on a motor driven Scott tester of 150 pounds and 300 pounds capacity, both machines operating at a speed of 12 feet per minute.

"The skein breaks and sizes tabulated hereafter are the result of 36 skein breaks and 36 sizings in each test. Where the yarn was broken on the single strand tester, twenty-five breaks were made from each of twelve bobbins in each test. To compare the results of the several tests, the average size of yarn has been multiplied by the average break in pounds or ounces as the case may be for each test, which gives a figure directly comparable regardless of the difference in size of yarn within certain limits, and is designated in the following tables as skein break factor or single yarn factor.

"The deviation of yarn size was obtained as follows: Using the average size of all the weighings in any individual test as a basis, then the deviation of each weighing from this average was determined, and then the average of these deviations was divided by the average size. Multiplying this result by one hundred gives the per cent of deviation from the average size, which is the method used by the U. S. Government in their experimental work.

"We will not attempt to theorize on this system of spinning, as the results of these tests would seem to be a sufficient confirmation of the principles involved. It appears quite obvious, however, from our tests, of which only a portion are recorded here, that four rolls are more advantageous than three on slubbers and roving frames, and perhaps five might be better than four, because the more gradual the attenuation of the sliver or roving, the more uniform the yarn and the more parallelized the cotton fibers become. For example, suppose the total draft on a roving frame is six, then with the customary three rolls and a draft between the back and middle roll slightly in excess of one, the remaining draft between the middle and front roll is almost six. Whereas with four rolls the draft between the back and third roll would be perhaps one and one-half, two between the third and second and two between the second and first, which obviously is a much less severe manipulation of the cotton fibers than the foregoing example. With four rolls the total draft could be increased to eighteen and still the draft between any two rolls need not exceed three.

"By the use of a four roll slubber and four roll roving frame, we have spun yarn which, in almost every instance, has equalled or exceeded in strength and equalled in uniformity the yarn spun by the mill with their usual number of processes from the same drawing frame sliver,—yet in each instance we used one and sometimes two processes of speeders less than the mill. The results of these tests seem to confirm fairly conclusively the primary importance of the parallelizations of fibers, while, on the other hand, they seem to minimize the value of doublings after the sliver has passed the drawing frames.

"The advantages of the use of the four roll slubbers and fly frames are obviously the elimination of one or more speeder processes and the consequent reduction in labor

costs, power, floor space, etc., while at the same time it reduces appreciably the number of piecings, which is always apt to be a cause of defective yarn. Another possible advantage using the same staple of cotton is an increased yarn strength providing the number of speeder processes is not reduced, or perhaps an equally strong yarn with a slightly shorter staple of cotton if four rolls are applied to the mill's present equipment of speeders and slubbers.

"These tests embrace yarns from 9s carded to 60s combed, with cotton varying in staple from a scant inch to a full 1 1/16 inch. Test 5 is especially complete in that it embraces twenty-six individual tests, the yarn in which is all made from the same sliver. It will be noted in test 5 where the draft on the slubber is increased by gradations from six to eighteen, and the draft on the roving frame from five to eighteen, and the draft on the spinning from slightly under six to approximately fourteen, that no matter what combination of drafts was used the yarn as spun with four rolls was in every instance stronger than the yarn spun by the mill with three roll speeders from the mill sliver. It would seem from this series of tests as though the draft on the slubbers and fly frames could be increased or decreased with apparent indifference, within certain limits, so far as the final strength of the yarn is concerned.

"Where the word 'normal' is used in these tabulations it means the normal draft as used by the mill, whatever that may have been, and the word 'none' means that the particular machine referred to was not used.

MILL NUMBER ONE.
Cotton Staple 1-Inch Carded.

Number of Test	1	2	3	4	5	6	7	8	9	10
Number of Doublings after Cards	288	24	48	24	288	48	24	24	24	12
Number of Drawing Processes	2	1	1	1	2	1	1	1	1	1
Draft on Slubber	Normal	6.6	Normal	6.6	Normal	Normal	6.15	6.34	6.34	6.34
Draft on First Process of Speeders	Normal	8.1	Normal	8.1	Normal	Normal	6.15	6.34	6.34	6.34
Draft on Second Process of Speeders	Normal	None	Normal	None	Normal	Normal	None	None	None	None
Number of Bobbins in Creel per Spindle on Spinning Frames	2	2	2	2	2	2	2	2	2	1
Hank Roving at Spinning	3	4	4	4	3	4	3	3	3	3
Draft at Spinning	13.30	10.26	10.00	9.86	13.30	10.00	13.50	14.20	13.85	7.25
Size of Yarn Spun	19.89	20.03	20.29	20.47	19.72	20.39	19.51	20.61	20.04	20.32
Yarn Strength in pounds 120 yard skeins	85.4	84.8	83.5	82.7	85.4	81.0	83.9	78.7	78.9	71.7
Skein Factor (Size times strength equals Factor)	1699	1699	1694	1693	1684	1654	1637	1622	1581	1457
Average Deviation in Size	.535	.757	.375	.487	.548	.502	.426	.520	.518	.655
Average Deviation in per cent	2.69	3.77	1.85	2.38	2.78	2.46	2.19	2.52	2.58	3.22
REMARKS:										
Spun at mill or at laboratory from mill sliver	Mill	Lab.	Mill	Lab.	Mill	Mill	Lab.	Lab.	Lab	Lab.

"Comparing tests 1 and 5, exhibiting the strength of mill spun yarn, with tests 7, 8 and 9, exhibiting the strength of laboratory yarn spun from the same sliver that the mill used in tests 1 and 5, it will be observed that although the doublings after the cards was 288, with two processes of drawing and three processes of fly frames, including the slubber, the average skein break factor of tests 1 and 5 was 1692 as compared with skein break factor of 1613 for the yarn spun in tests 7, 8 and 9 where the doublings after cards was only 24, with one process of drawing and two processes of fly frames only, including the slubber. In other words, reducing the doublings after cards from 288 to 24, which means omitting one process of drawing and one process of speeders, decreased the strength of the yarn only 4.7 per cent, and these reductions in the doublings after the cards did not apparently make the yarn any more uneven than the mill spun yarn.

"Comparing tests 3 and 6, which are mill spun yarns, with tests 2 and 4 which are laboratory yarns spun from the same sliver as that used by the mill in tests 3 and 6, it will be observed that the average skein break factor in tests 3 and 6 is 1673, and in tests 2 and 4, 1696. That is the laboratory spun yarn is slightly stronger than the mill spun yarn although in the former one entire process of speeders was omitted, which reduced the doublings after cards from 48 in the case of the mill spun yarn to 24 in the case of the laboratory spun yarn, or a reduction of 50 per cent.

"Another interesting feature of these tests is a comparison of the laboratory spun yarns in tests 2 and 4, where the skein break factor is 1696, with mill spun yarn in tests 1 and 5, where the average skein break factor is 1692, or practically equal to the laboratory spun yarn in strength, yet the doublings after cards in tests 1 and 5 is 288 as compared with the doublings after cards in tests 2 and 4 of only 24. Since the strength of the laboratory spun yarn in tests 2 and 4 is slightly in excess of the strength of the mill spun yarn in tests 1 and 5, and since the evenness of all four yarns is practically the same, it might be inferred that a reduction in doublings after cards from 288 to 24, leaving out one process of drawing and one process of speeders, was equivalent in its final effect to a reduction in draft on the spinning from slightly over 13 in tests 1 and 5 to approximately 10 in tests 2 and 4.

"Referring to test 10, it will be noted that when the doublings after cards were reduced to 12, and the yarn was spun from single roving, with one process of draw frames and two processes of fly frames, including the slubber, that the skein break factor, dropped to 1457, which is almost 15 per cent below the average skein break factors of laboratory spun yarn in tests 2 and 4 and mill spun yarn in tests 3 and 6, which would seem to indicate that the reduction of doublings had been carried to an excess. That is, decreasing the doublings after cards from 288 to 24 had less effect on the strength and uniformity of the yarn than decreasing the doublings after cards from 24 to 12, from which it might be concluded that all doublings after cards in excess of 24 were in a measure superfluous, while at least 24 doublings after cards would seem to be absolutely necessary.

MILL NUMBER TWO.
Cotton Staple 1-Inch Carded.

Number of Test	1	2	3	4
Number of Doublings after Cards	72	36	72	72
Draft on Slubber	5.8	18.27	5.8	5.64
Draft on First Process of Speeders	7.16	None	7.16	7.14
Draft at Spinning	7.6	8.56	7.6	7.8
Size of Yarn Spun	20.17	19.22	19.68	19.59
Yarn Strength in pounds 120 yd skeins	79.5	82.6	79.2	72
Skein Factor (Size times Strength equals Factor)	1605	1588	1558	1409
Average Deviation in Size	.377	.476	.389	.548
Average Deviation in per cent	1.87	2.48	1.98	2.80
REMARKS:				
Spun at mill or at laboratory from mill sliver	Lab.	Lab.	Lab.	Mill

All yarn spun from single roving and two processes of drawing.

"Comparing test 4, (Mill No. 2) which is mill spun yarn,

with tests 1 and 3, which are laboratory spun yarns, it will be observed the average skein break factor in tests 1 and 3 is 1582, which is over 12 per cent greater than the skein break factor of the mill spun yarn in test 4, although all of these yarns were spun from the same drawing frame sliver and with the same number of doublings and processes after cards. Since the only difference in manipulation between the laboratory spun yarn and the mill spun yarn is in the number of rolls on the slubber and speeder, that is, four in the case of the laboratory yarn and three in the case of the mill yarn, it may be inferred that by the use of four rolls on the slubber and speeder, in this instance, at least, the strength of the yarn was appreciably increased.

"Test 2, which is also a laboratory spun yarn, where the slubber roving was taken direct to the spinning frame, is interesting in comparison with tests 1, 3 and 4, in that the skein break factor is equal to the average skein break factor of tests 1 and 3, and also 12 per cent higher than the mill yarn factor indicating possibly that doublings after the cards in excess of 36 may be superfluous, for producing the quality of yarn required by this mill. In fact, it might be possible to omit one of the processes of drawing as well as the one process of speeders and still equal the mill spun yarn in strength and evenness. It is interesting to note in test 2 that the draft on slubber was slightly in excess of 18.

MILL NUMBER THREE.
Cotton Staple 1 1/16-Inch Carded.

Number of Test	1	2	3	4
Number of Doublings after Cards	432	432	216	216
Draft on Slubber	Normal	Normal	8.9	8.9
Draft on First Process of Speeders	Normal	Normal	None	None
Number of Bobbins in Creel per Spindle on Spinning Frames	1	1	1	1
Draft at Spinning	7.82	7.82	9.25	9.00
Size of Yarn Spun	9.08	9.11	9.52	8.76
Yarn Strength in pounds 120 yard Skeins	241	233	232	225
Skein Factor (Size times strength equals Factor)	2190	2123	2209	1971
Average Deviation in Size	.329	.374	.202	.169
Average Deviation in per cent	3.62	4.11	2.12	1.93
REMARKS:				
Spun at mill or at laboratory from mill sliver	Mill	Mill	Lab.	Lab.

All yarn spun from single roving and three processes of drawing frames.

"Comparing the average skein break factor of tests 1 and 2 (Mill No. 3) which is mill spun yarn with the average skein break factor of tests 3 and 4, which are yarns spun in the laboratory from the same sliver that was used by the mill, it will be observed that these skein break factors are practically equal, the difference being only 3 per cent in favor of the mill spun yarn. Yet in the laboratory spun yarn the slubber roving was taken direct to the spinning frame with a consequent reduction in doublings after cards of from 432 in the case of the mill spun yarn to only 216 in the case of the laboratory spun yarn.

"Comparing the evenness of the mill spun yarn with the laboratory spun yarn, it will be observed that notwithstanding the reduction of doublings in the case of the latter, that it is much more even than the mill spun yarn with twice the doublings, the average deviation in the case of the mill spun yarn being 3.86 per cent which in the case of the laboratory yarn is only 2 per cent. Apparently four rolls on the slubber has had an evening effect on the roving which was not obtained with the mill three-roll slubber.

"Here again one process of drawing certainly, and two processes of drawing probably, could be omitted without impairing the strength or uniformity of the yarn provided the draw frames were operated properly.

MILL NUMBER FOUR.
Cotton Staple 1-Inch Carded.

Number of test	1	2	3	4	5	6
Number of Doublings after Cards	144	144	288	288	288	144
Draft on Slubber	6.65	6.65	4.95	4.2	4.2	6.65
Draft on First Process of Speeders	8.00	8.00	4.95	4.58	4.58	4.58
Draft on Second Process of Speeders	None	None	4.84	6.35	6.35	None
Draft at Spinning	10.60	10.40	9.50	10.65	10.65	10.40
Size of Yarn Spun	21.24	20.40	21.61	21.41	21.23	20.98
Yarn Strength in Pounds 120 yard skein	84.1	87.1	81.8	81.4	81.0	81.7
Skein Factor (Size times Strength equals Factor)	1786	1777	1768	1743	1719	1714
Average Deviation in Size	.518	.417	.385	.476	.483	.436
Ave. Deviation in per cent	2.44	2.04	1.78	2.22	2.27	2.08
REMARKS:						
Spun at mill or at laboratory from mill sliver	Lab.	Lab.	Lab	Mill	Mill	Lab.

"Comparing tests 4 and 5, (Mill No. 4) which are mill spun yarns, with tests 1, 2 and 6, which are yarns spun in the laboratory from the same sliver that the mill yarn is made from, it will be observed that the average skein break factor of the two mill yarns is 1731, and the average skein break factor of the laboratory yarns is 1759. Yet the number of doublings after cards in the case of the laboratory yarns is 50 per cent less than the doublings after cards in the mill yarn, brought about by omitting one process of speeders.

"Comparing test 3, a laboratory spun yarn, using the same number of processes that the mill uses except with four rolls instead of three on the slubber and speeders, it will be noted that the strength has been slightly increased and the evenness somewhat improved although the difference in the results between test 3 and tests 1, 2 and 6, would not seem to be sufficient to justify the second process of speeders In other words the maximum strength of yarn seems to have been obtained with the use of only two processes of fly frames including the slubber.

"Tests 1 to 24 inclusive are from yarn spun in the laboratory from the same sliver that the mill used in spinning yarns tested in experiments 25 and 26, (See table Mill No. 5.) yarns tested in experiments 1, 4, 7, 21, 23 and 24 were spun with the same number of processes as is used in the mill (but with four roll slubber and speeders) while the balance of the yarn spun in the laboratory was made with one process of speeders less than the mill uses. The average skein break factor of tests 1, 4, 7, 21, 23 and 24, is 1813 and of the balance of the laboratory tests 1821, while the average skein break factor of the two mill yarn tests is only 1683, from which it would appear that the yarn spun with 288 doublings after cards was no stronger than the yarn spun with only 144 doublings after the cards in the case of the laboratory yarn and that all laboratory yarn whether spun with three processes of speeders including the slubber, or only two processes of speeders including the slubber, was over 8 per cent stronger than the mill spun yarn. The interesting part of these tests is that although the draft on the slubber was increased from six to eighteen, and the draft on the speeder from five to eighteen, it apparently made no appreciable difference in the ultimate strength or evenness of the yarns. Tests 1 to 26 inclusive are arranged in sequence from the largest to the smallest skein break factor, and are the results of the sizings and breaks of 864 individual skeins which should seem to be a sufficient number of tests to eliminate any freak results and any personal equation.

MILL NUMBER FIVE.

Cotton Staple 1 1/16-Inch Carded.

Number of Test	1	2	3	4	5	6	7	8	9	10	11	12	13
Number of Doublings after Cards	288	144	144	288	144	144	288	144	144	144	144	144	144
Draft on Slubber	6	8	8	6	12	10	6	18.27	16	6	14	8	6
Draft on First Process of Speeders	7	12	14	6	10	14	6	8	8	18.27	10	10	16
Draft on Second Process of Speeders	7	None	None	6	None	None	6	None	None	None	None	None	None
Draft at Spinning	6.70	10.5	9.00	9.16	8.15	7.30	6.85	6.90	7.80	9.35	7.12	12.50	10.70
Size of Yarn Spun	28.60	27.91	27.68	27.47	28.42	27.95	28.07	28.47	27.55	28.24	28.55	28.06	28.39
Yarn Strength in Pounds 120 yard skein	65.9	66.7	66.9	67.0	64.7	65.6	65.2	64.2	66.2	64.6	63.7	64.8	64.0
Skein Factor (Size times strength equals factor)	1885	1861	1852	1842	1839	1834	1830	1828	1824	1824	1819	1818	1817
Average Deviation in Size	.672	.558	.556	.576	.671	.505	.751	.615	.748	.678	.694	.611	.624
Average Deviation in per cent	2.35	2.00	2.01	2.09	2.36	1.81	2.68	2.16	2.71	2.40	2.43	2.18	2.20
REMARKS:													
Spun at mill or at laboratory from mill sliver	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.

MILL NUMBER FIVE (Continued.)

Number of Test	14	15	16	17	18	19	20	21	22	23	24	25	26
Number of Doublings after Cards	144	144	144	144	144	144	144	288	144	288	288	288	288
Draft on Slubber	10	8	8	6	10	6	14	10	12	8	6	Normal	Normal
Draft on First Process of Speeders	10	18.27	16	12	12	14	8	5	12	5	6	5.78	5.78
Draft on Second Process of Speeders	None	None	None	None	None	None	None	5	None	5	5	5.93	5.93
Draft at Spinning	9.80	6.70	7.96	13.50	8.35	12.20	8.78	7.76	6.83	9.55	13.46	14.74	14.74
Size of Yarn Spun	27.62	28.40	28.16	27.58	28.18	28.19	28.38	28.20	27.67	27.20	28.23	25.80	25.85
Yarn Strength in pounds 120 yard skeins	65.7	63.9	64.4	65.7	64.2	64.1	63.3	63.7	64.7	65.8	61.4	66.4	64.0
Skein Factor (Size times strength equals factor)	1815	1815	1814	1812	1809	1807	1796	1796	1790	1790	1737	1713	1654
Average Deviation in Size	.515	.523	.561	.720	.671	.674	.777	.557	.775	.613	.885	.533	.655
Average Deviation in per cent	1.86	1.84	1.99	2.61	2.35	2.39	2.74	1.98	2.80	2.25	3.14	2.07	2.53
REMARKS.													
Spun at mill or at laboratory from mill sliver	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.	Lab	Lab.	Lab.	Mill	Mill

MILL NUMBER SIX.

Cotton Staple 1-Inch Carded.

Number of Test	1	2	3	4	5	6	7	8	9	10
Number of Doublings after Cards	576	144	144	288	288	288	144	144	288	576
Draft on Slubber	3.08	8.00	8.00	8.00	8.00	8.00	14.00	14.00	7.50	5.10
Draft on First Process of Speeders	4.88	10.14	10.14	7.00	7.00	7.00	12.00	12.00	6.5	5.1
Draft on Second Process of Speeders	5	None	None	6	6	6	None	None	5.5	5.1
Draft on Third Process of Speeders	5.81	None	None	None	None	None	None	None	None	5.1
Draft at Spinning	8.75	10.90	11.69	6.45	6.12	6.25	6.45	6.45	8.15	6.00
Size of Yarn Spun	33.95	33.19	33.59	38.93	38.70	40.15	38.59	40.44	40.34	39.41
Yarn Strength in pounds 120 yard skeins	38.5	43.0	42.3	35.1	34.5	33.0	33.9	32.0	31.7	29.9
Single Strand factor (Size times break in ounces)	.223	....	225	....	....	....	....	....	....	....
Skein Factor (Size times break equals Factor)	1307	1429	1421	1366	1335	1325	1308	1294	1279	1178
Average Deviation in Size	.73	.834	.874	.611	1.190	.966	1.160	.943	.940	.950
Average Deviation in per cent	2.15	2.51	2.60	1.57	3.09	2.41	3.01	2.33	2.33	2.41
REMARKS:										
Spun at mill or at laboratory from mill sliver	Mill	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.	Lab.

All yarn spun from double roving and two processes of drawing frames.

MILL NUMBER SEVEN.

Using 1 1/16-Inch Combed Peeler.

Number of Test	1	2	3	4	5	6	7	8
Number of Doublings after Cards	414,720	414,720	414,720	414,720	414,720	1,658,880	1,658,880	1,658,880
Draft on Slubber	10.00	10.00	12.00	12.00	7.00	Normal	Normal	Normal
Draft on First Process of Speeders	11.60	11.60	13.75	13.75	18.25	Normal	Normal	Normal
Draft on Second Process of Speeders	None	None	None	None	None	Normal	Normal	Normal
Draft on Third Process of Speeders	None	None	None	None	None	Normal	Normal	Normal
Draft at Spinning	10.00	12.50	10.00	8.30	9.10	Normal	Normal	Normal
Size of Yarn Spun	37.88	48.23	58.42	47.44	39.68	36.95	48.13	56.49
Yarn Strength in pounds 120 yard skeins	63.2	43.9	35.7	47.3	56.0	63.7	45.2	35.4
Skein Factor (Size times Strength equals Factor)	2394	2117	2085	2244	2222	2354	2175	2000
Average Deviation from Average Size	1.148	1.231	1.728	1.499	1.414	.794	.894	1.719
Average Deviation in per cent	3.03	2.55	2.96	3.16	3.56	2.15	1.86	3.04
Remarks:								
Spun at mill or at laboratory from mill sliver	Lab.	Lab.	Lab.	Lab.	Lab.	Mill	Mill	Mill

All yarns spun from double roving and three processes of drawing.

"Tests 4 to 10 (Mill No. 6) inclusive were made to demonstrate what could be done with this cotton in spinning No. 40 yarn, using 2, 3 and 4 processes of speeders. It will be noted that in test 10, which has the most doublings, shortest drafts and four processes of fly frames, that the yarn was the weakest; indicating perhaps, too much working. This deduction is also confirmed by test 1.

"On the single yarn breaks, of which there were 300 from tests 1 and 3 there were 25 breaks at 5 ounces and below; 94 at 6 ounces and below; and 213 at 7 ounces and below; 106 at 6 ounces and below, and 182 at 7 ounces and below, for the laboratory spun yarn.

"Comparing test 1, which is the mill spun yarn, with tests 2 and 3, which are yarns spun in the laboratory from the same sliver that the mill yarn was made from, it will be noted that the average skein break factor of tests 2 and 3 is 9 per cent greater than the skein break factor of the mill spun yarn, and yet the number of doublings after the cards in the case of the laboratory yarn is only one-quarter of the doublings after the cards used in the mill. It will also be noted that the single yarn factor in test 3 is equal to the single yarn factor in test 1, which confirms the equality of the laboratory and the mill spun yarns.

"Comparing tests 1, 2 and 3 of yarn spun from the same sliver as the mill spun yarn used in tests 6, 7 and 8, (Mill No. 7) it will be observed that in each instance the laboratory spun yarn is equal to, or stronger than the mill spun yarn, although the number of doublings in the case of the laboratory yarn is only one-quarter of the mill doublings; that is the mill roving was prepared on four processes of fly frames including the slubber, whereas the laboratory yarn was prepared on only two processes of fly frames including the slubber. Tests 4 and 5 of laboratory spun yarn confirm tests 1 and 2, although made under slightly different conditions of drafts. The yarns from these tests was wound on a blackboard alongside of the mill spun yarn and it was impossible to distinguish the one from the other.

MILL NUMBER EIGHT
Using 1 1/16-Inch Carded Peeler.

	1	2	3
Number of Tests			
Number of Doublings after cards	288	144	144
Draft on Slubber	8.65	4.48	4.48
Draft on First Process of Speeders	8.30	5.47	5.47
Draft on Second Process of Speeders	None	6.24	6.24
Draft on Third Process of Speeders	None	None	None
Draft at Spinning	6.5	10.00	10.00
Size of Yarn Spun	23.06	23.01	22.84
Yarn Strength in pounds 120 yard skeins	79.1	81.2	79.7
Skein Factor (Size times Strength equals Factor)	1824	1868	1820
Average Deviation from Average Size	.600	.571	.599
Average Deviation in per cent	2.60	2.48	2.62
REMARKS:			
Spun at mill or at laboratory from mill sliver	Lab. 15 Breaks and sizings	Mill 5 Bobbins Tested 15 Breaks and sizings	Mill Same Bobbins as Test No. 2 15 Breaks and sizings

"There are no special remarks to make in regard to the test (Mill No. 8), except that the results confirm the general deductions made from the preceding tests."

At the conclusion of the paper Mr. Everett called for questions and discussions in relation to the question of the application of four roll drafting on roving frames.

Mr. Walen of the Cotton Research Company of Boston stated that he had worked some on the probability of elimination of processes in cotton manufacture. However, he had found in his tests that mill cotton or sliver used when worked in the laboratory machinery always broke stronger than the same cotton or fiber worked in the same manner in the mill. He told of spinning 28's yarn that broke better than the same mill yarn using a four can coiler card and slubber direct to the spinning frame. Using this same system except adding the intermediate and fine frame caused a drop in strength in the making of 15's yarn. Other experiments were tried, where, in the use of combers, the drawing was dispensed with, gaining strength with the elimination of these processes.

It was Mr. Walen's opinion that parallelization of the fibers was more important to the strength of the yarn than the number of doublings.

In his elimination of processes, Mr. Walen stated that it was very easy to do so in the experiment of the 15's yarn using 1-inch staple but it was not so successful when the experiment was tried with 7/8-inch staple.

Mr. Walen asked, "Have you tried more than four rolls in the slubber you experimented with?"

Mr. Sheldon replied "I have not tried more than four rolls on the slubber because we thought the mechanical difficulties involved would offset any gain in textile manipulation."

One of the audience asked if Mr. Sheldon had tried four rolls in drafting on the spinning frame and this was answered in the affirmative, but the experiments did not prove so successful, as due to the smaller bulk of cotton involved in spinning it did not adapt itself as well as did the larger bulk of the slubber sliver.

Mr. Thompson of the Berkshire Cotton Company remarked that mills had of recent years taken on a mania for production, especially with carding, often doubling the production of the cards, combers and other preparatory machinery with the idea of reducing the costs. In short, today the cotton was considerably overworked in American mills and any invention or change leading to the elimination of processes would certainly be beneficial to the industry. He continued with the statement that today cotton is grown not for the mills but for the benefit of the farmer and the defeat of the boll weevil without regard to mill requirements. This disregard for mill needs was tending to make uneven staple in the war against the weevil pest. This unevenness causes much of the unevenness in the yarn today.

This ended the discussion on the subject of "Four Roll Drafting on Slubbers."

Mr. Everett next introduced James McDowell of the Sharp Manufacturing Company of New Bedford, Mass., who in his preliminary remarks urged upon American cotton manufacturers to aim more at quality than quantity. If good yarn was being made in England and then imported to America to be woven up, why could not this yarn be made in America. There is enough cotton yarn imported in America each week to keep all the mills of New Bedford running full time, he stated.

Mr. McDowell then delivered a paper on

Cotton Fibers from a Layman's Viewpoint.

saying in part:

The analysis or testing of textile fabrics is rapidly becoming more necessary. This research will be made by the manufacturer and buyer from two different standpoints—one with an idea of maintaining its appearance and cheapening its construction the other having in view a retention of the quality both of the finished and raw material and safeguarding methods employed to obtain the same cloth.

Until a comparatively recent date in cotton manufacturing—except where processes of a chemical nature were needed—it was considered that there was no room for scientific knowledge and that those rules and the craft of hand, which is the outcome of practical experience and which is known as the rule of the thumb, were ample to secure the highest attainment of perfection.

Where the rule of the thumb is employed it always happens that one process is carried on without any thought of the next process and very often injury occurs which the next process cannot overcome.

The advance of technical education in Great Britain has shown, however, that there is no department of industrial art where there is more need of scientific knowledge than that of textile manufacture, not only on account of the nature of the raw material used, but because of the varying processes it has to pass through.

It is necessary when discussing the testing of textiles to point out that the subject can by no means be exhausted by the most careful examination of the operations carried out. In most testing rooms in the mill it is usual to have a warp reel and strength-testing machine, a balance for yarn, and it may be a moisture-testing apparatus, also a twist-tester. In quite a few exceptions one may find a microscope and some other machines, regarded by the boy in charge, who is known as the tester, with reverence, and seldom touched. Throw cold water on these statements as you may, they still contain so much truth that you must be struck with the utter absurdity of placing a boy in the testing room, who knows nothing of manufacturing or the science of testing. His work could not be of much value to the management unless he were to take a course of study. Place a man with reasonable talent in a testing room and you will find that the room becomes the center of control from which every improvement and every step of progress will come.

As so little is actually known among spinners as to the

qualities and spinning value of cotton that subject might be studied to advantage. Doing so might also suggest the advisability of a special inquiry into the value of the distinctive varieties with a view of finding supplies capable of producing a yarn equal to what they are now producing and at a lower cost.

Twist in the fiber, which is so marked in cotton, is not generally possessed by any other vegetable fiber. Almost all other fibers are very smooth with no form of a twist, such as Vegetable Down or Bombax Cotton, Milk-Weed, or Thistle-Down, which exceeds the lustre of silk but cannot be spun, as a recent test at the Lowell Textile School will show, although we have heard a good deal of late that it is not the twist in cotton but its strength and length of fiber which gives us the strongest yarn.

The peculiar characteristics of twist, which are so well marked in well-matured fibers of cotton and give it a good spinning quality, are not in the fibers taken from a pod that has not opened. These are some of the reasons that bolly and snap cotton do not spin well.

Not only my own tests, but tests made by Dr. Bowman and Dr. Ball, all go to show that the essential thing about cotton is its twist, also its fineness of fiber, as the more fibers in the cross section the stronger the yarn.

The functions of twist are to bind the fibers together so as to prevent slipping under a certain strain, and the strength of yarn may be unsatisfactory both because of excessive twist and from insufficient twist. Twist may be said to have been applied in excess when it exceeds that which is necessary to prevent a slipping of the fibers under strain. The maximum twist strength limit may only be raised by an improvement in the order of the fibers and by using stronger and finer cotton.

Cotton grown in different parts of the world differs considerably in length and fineness of staple, such as our own cotton grown in the islands off the coast of Georgia and Florida or the cotton with short fibers grown in China and India. With these the length varies from two inches to $\frac{5}{8}$ of an inch. The length and character of any cotton can only be taken approximately for any given season, as the average length and diameter vary in different seasons when grown in the same fields and from the same seeds.

The cotton plant in the various countries of cultivation presents certain differences and characteristics which are more or less apparent, but it is in the product of the plant, in the fibers themselves, that the most distinctive variations exist. To the naked eye the chief differences lie in the length, cleanliness, and color, while strength can be determined by those who are accustomed to handling the cotton. The apparent characteristics which determine the quality of cotton are: (1) legnth of fiber; (2) fineness; (3) color; (4) cleanness; (5) uniformity; (6) strength; and (7) elasticity. The microscopical characteristics are: (1) natural twist; (2) thickness of the fiber walls; (3) density of fiber; (4) uniformity (or otherwise); (5) hollowness; and (6) serrated edges.

Length of the fibers—Not only do different varieties of cotton vary in length, but cotton from the same plantation and the same crop also vary. The minimum length of commercial cotton is about $\frac{5}{8}$-inch, while the maximum is about two inches.

Fineness—Fineness is always a desirable quality. A fine fiber can be more easily and uniformly twisted than a coarse one, and a stronger and better looking thread can be obtained.

Color—Deliveries of any particular class of cotton should be uniform in color, otherwise a shaded or streaky yarn will result. The colors of different cottons vary from a dead white to a rich, light golden tint, and for special classes of yarn the selection of cottons as to color is important. Old cotton and new cotton differ, the former being dryer, more brittle and weaker if not kept in proper moisture condition.

Elasticity—Dry, harsh fibers have little elasticity. The property of elasticity is necessary to enable the cotton to withstand the tearing and drawing actions to which it is subjected in the course of manufacture.

General Appearance—An experienced operator in cotton transactions can give a shrewd guess as to the quality of any particular supply immediately when it comes in sight.

SECRETARY HARRY C. MESERVE.

The uniformity of color, the absence of impurities, and the compactness of the fibers all speak for themselves to a certain extent.

The microscopical characteristics of the cotton fiber are peculiar, but they open the road to a clear understanding of their necessity in rendering the material of commercial value. The fiber is one long, flat cell or tube closed at the apex. It shows many convolutions (200 to 300) with the outer walls thicker than the center. The density or opaqueness, the number of twists, and the thickness of the walls vary in different varieties. The serrated edges are formed by the natural convolutions, and these cause the fibers to interlock with one another, thus giving the yarn cohesion and strength.

When we take into consideration the great delicacy of the cotton fiber and the phenomena of its physical structure, it is easy to understand that the utmost carefulness must be extended to it in its application to technical purposes, if its essential characteristics and properties are to be retained in any proportion to their original and natural quality. Under ordinary circumstances of manufacture only slightly over 10 to 15 per cent of the strength can be utilized; and in cases where the material to be converted into yarn has been oper-

ated on by imperfectly worked machinery or where the productive capacity of the various machines has been taxed beyond a proper limit, then only about 5 to 10 per cent of the fiber strength is left available for the constitution of the yarn.

The cotton buyers, provided they possess the knowledge of the working of the material, should be responsible for the quality of the yarn and they will have the greatest interest in obtaining cotton of the best quality for the price which the mill can afford. There are, no doubt, numerous instances where the superintendent or agent is not sufficiently informed in this respect; but where such is the case, the substitute should be understood to be a man of the strictest integrity, one who possesses a practical knowledge of the working of different classes of cotton.

In the outside commercial transactions of a cotton mill the buying of cotton is by far the most important and requires a discriminative power which can only be gained by experience and study of the peculiarities which characterize the different varieties of the cotton plant product. Successful cotton buying is as essential to the success of a concern as good and economical management.

Cheap Mixings—Practically, the object of mixing different cottons together is to make the cost of the cotton as low as possible. Like everything else, it is at times carried to excess and always with disastrous results. With a poor mixing it is impossible to make a good yarn and the attendant consequences in the working are: (1) increase in waste; (2) loss in production; (3) more labor in keeping the machinery clean; (4) loss in wages to the employees, and more work; (5) general discontent throughout the mill; and (6) the yarns of the mill get a bad name in the market.

In these respects the responsibilities of the cotton buyer and classer are very great and can only be fully appreciated by those directly interested. The competition in the cotton trade has made the margin between the cost of the material and the yarn so small that no means of increasing it should be neglected. Unfortunately, however, most treasurers, directors, or agents, when confronted with the difficulty of making both ends meet, are ever ready to look to the mixing room for the means of salvation without fully going into the question of economies in other directions. When once the yarn shows signs of depreciation in quality or price, an exhaustive study of the working of every department should be made, and if this fails to account for the change, then the quality of the mixing should be improved. Superintendents are frequently unreasonably blamed when the quality of the yarn falls off, or shows an unaccountable decline in price, when perhaps an inferior mixing has been supplied to them. On the other hand, some of them are ever ready to blame the mixing for defects in the yarn or insufficient production when perhaps the supervision exercised has not been all that it might have been. An expensive mixing is costly, but one of a quality insufficiently good to produce the class of yarn required is infinitely more expensive in the end. Having to reduce the speed of the front roll as well as the spindle speed both affect the cost of the yarn or cloth.

Of late we have heard a great deal about the high density bale and that the pressure in baling would damage the fiber, but so far as I have been able to observe in my association with cotton I have been unable to attribute any damage to the fiber in baling. The strength of yarns produced in mills situated near the cotton fields and by others using cotton which has not been pressed is not found to be any greater than that of yarns in mills using compressed bales when proper treatment has been given to it. The pressure made by the pickers or in slubbing, or even in spinning, is greater on the individual fibers, and in the process in the mill where you find a lot of white dust around the machine you will find that it comes from damaged fibers which have been ground to powder.

If the amount of moisture present in the air can influence the count of yarn to such an extent as to show an actual 40s yarn as 39s on a humid day, and 41s on a dry day, to influence the strength of cloth from 12 to 18 per cent and possibly more, it would seem unreasonable that exceptions should be taken to goods which fall short of a contract or specification by these amounts unless reliable tests have been carried out under stated and agreed conditions of humidity.

The average length of several of the Egyptian cotton fibers ranges from 1¼ to 1⅝ inches and the diameter 1/1300 to 1/1500. The excellence of the Egyptian growth is attributed to the length, strength and fineness of the fibers and to the absence of the great variation in fibers comprising their staple, as well as other features, also the manner in which the fibers are pressed together under the influence of twist enables the production of yarn with the use of a lower twist coefficient than any other cotton with the exception of Sea Island. Its excellence is due to length, strength and fineness as well as uniformity of the fibers and its reliability in regard to immunity from variation in quality throughout the bale. In good body American cotton 14,000 to 20,000 fibers weigh one grain, hence one pound of cotton contains 140,000,000 fibers, which, if placed end to end, would reach 2,200 miles. Fibers in cross-section of a 40/1 yarn—American 1⅛ inch staple amount to 120; 40/1 Egyptian Sakellarides cross section contains 160 fibers.

After the reading of the paper Mr. McDowell explained his methods of selection of cotton for his mills by a very interesting set of slides. The basis of the slides was to show the lack of twist in the fibers, the immature fibers, the thickness of the fiber walls and uniformity and fineness or coarseness of the fibers.

The method of selection consists of getting samples from all the possible cotton dealers in the various sections of the cotton growing States and submit them to standard microscopic tests, along with tensile and grading tests, thus eliminating certain sections of the country as producing undesirable cotton for the particular requirements of the mill. Cotton grown in North Georgia had been eliminated for two years by the Sharp Manufacturing Company as not suited for their needs. Cotton grown in the sections of North Texas and Red River Valley were found to be most desirable in their characteristics. The section around Paris, Texas, was found to be most promising last year. Cotton grown around Waco, Texas, last year showed an abundance of natural oil.

Some talk was given in the matter of fumigation of cotton. Slides were shown where the gas from fumigation actually blew up the walls of the cotton fibers like a toy balloon and when this cotton was dyed, spots resulted from

these small inflations due to the lack of penetration of the colors.

Mr. Everett then called for any questions that the audience might care to ask Mr. McDowell.

Discussion.

Mr. Perkins of Harmony Mills asked if cotton to be uniform should be all from the same picking (and there are three pickings per year) and since the production was ⅛ to ½ bale per acre, then it would take from six to nine acres of land to produce one bale of uniform staple, as required by Mr. McDowell's mills. So in this respect he asked Mr. McDowell just how much cotton he bought under such rigid tests each year.

Mr. McDowell came back with "I buy about 75,000 bales of cotton each year, and never in nine years have I had one bale arbitrated after my rejections upon these rigid standards. I always insist upon the delivery of the staple and characteristics as set forth in the sample submitted, else I do not buy from that broker again. The trouble with most mills today is that they buy on price and not staple and characteristics. A broker offers a print cloth mill cotton at 25 cents; another broker offers better cotton at 25½ cents and in five cases out of six the 25 cent cotton will be bought when at the same time the mill will make less production, lower quality, more waste and poorer running work. After all is it cheaper to run inferior cotton?"

The next question asked was as to how the cotton was judged in Mr. McDowell's system, by a few fibers under a microscope or by a large sample?

This was answered with the statement that one-half pound samples were used from each bale and cotton was judged both under the microscope and along the usual methods of classing and stapling. The things examined are the grade, staple, percentage of short fibers, immature fibers, spirality, and thickness of cell walls.

One of the audience asked about the uniformity of staple and grade; was this due to the soil and climate of a particular locality or whether the high lands and low lands of the particular locality in question lent a factor toward unevenness?

The answer given was: "God has given certain characteristics to the soil of certain sections along with a general degree of climate and these are the factors that lead to the uniformity of staple as raised in one section differing with another section of the country."

Mr. Perkins of Harmony Mills then asked just what percentage of 1⅛-inch staple would be found in 1⅛-inch cotton.

Mr. McDowell replied, "You will find about 25 per cent of the fibers will run about 1-inch or under, about 8 per cent will run 1 1/32-inch and the remainder will run full 1⅛-inch or better. Of course this will vary with different sections of the country."

Mr. Thompson of the Berkshire Cotton Company wanted to know if the poor, immature fibers, the short staple and other undesirable features of cotton could not be told by the drag in the pulling of the staple by an experienced person.

He was told that an experienced cotton buyer could go so far as to recognize a distinct note or musical sound when pulling cotton due to the "drag" or friction of good desirable staple. An English buyer was noted for his success in securing desirable cotton for his company in this country and this was due to his personally covering all the districts and going over the cotton just as the first pickings came in. By the drag and "sing" of the staple he could readily judge the value of the cotton being classed.

It was asked if any increased production had been noted at the Sharp Manufacturing Company due to this system of classing and elimination of certain producing districts.

The reply given indicated that the company was well satisfied with the results so far obtained and Mr. Thayer of the Lebanon Company of Pawtucket, R. I., arose and stated that he bought a great deal of yarn from the Sharp Manufacturing Company and though sometimes the yarn varied it was as a whole far above the average yarn purchased, which testified to the logic of the elimination method of cotton buying.

One of the audience asked if districts delivered practically as good cotton throughout the season as was estimated in the first sample sent.

Mr. McDowell answered that the first samples received were indicative of the general run of that particular district.

It was asked why more different grades of cotton were not tried, as from foreign countries, for example, in the making of various grades of American cloth? This was answered by the statement that the lessened growing of cotton in the South was opening up new fields of cotton growing—especially Brazil—in the ordinary run of 1-inch and 1⅛-inch staple. Brazil is rapidly coming to the front and better baling and handling in their native country will put the Brazilians well toward the front in the matter of cotton growers.

The speaker was asked if any machine had been invented to pull staple successfully. He replied that there were a number on the market but none of them could give one the experience and information imparted by the "sing" or "drag" of the cotton. The machines will tell you the amount of the various lengths of staple very readily though. He continued by stating that cotton is the only product that is grown perfect by nature and later spoiled by manipulation of human hands mostly due to ignorance and carelessness.

Mr. Walen, of the Cotton Research Company, stated that he had been able to photograph the sound emitted by the "drag" or "sing" of the cotton, but had found no definite advantage in doing so, though it was essential to know the character of the cotton when making tests.

Mr. McDowell then spoke of the elimination of processes and said that the main trouble with that was that the machinery builders really wanted more processes instead of less and consequently gave no encouragement along these lines.

A member of the Cotton Growers Cooperative Association of the South volunteered the information that the great trouble today was that the cotton grower of the South did not know just what the mills wanted. Certain ideas and standards should be set as just what was wanted and his association would certainly be glad to cooperate with the mills in endeavoring to furnish their requirements. Over one million bales had been handled by his association and not one bale of country damage had resulted.

One member of the audience asked how the Sharp Manufacturing Company conducted their mix.

To this Mr. McDowell replied that twelve 100 bale lots

were carried in stock and each 100 bales represented a mark. It was so arranged that 12 bales constituted a mix, one bale from each mark, and that by previous selection these 1,200 bales were not allowed to run out all at once but that the depletion was by elimination of one mark at a time and this depleted mark was replaced immediately by another 100 bale lot of another mark, so that the change in mix was systematic and gradual.

Mr. Davis of the Cotton Research Company asked about a previous statement of Mr. McDowell's where he had said that only 10 per cent of the total strength of the cotton fibers were utilized in the form of yarn.

"A cotton fiber," said Mr. McDowell, "has the same strength as a steel fiber of the same cross-section, for you can take a cotton fiber and a steel fiber of the same diameter and both will lift practically the same weight. To prove this further I broke a certain cross-section of fibers once and then broke the same cross-section in the form of yarn and found that the yarn only broke 1/10th as much as the fibers."

No more questions were asked and Mr. Everett called the meeting adjourned.

The Association Banquet.

which was held on Wednesday evening, April 25, was a record-breaker, and was held in two sections—meaning that the registration for the affair was so great as to make it impossible for all of them to be seated in one room, thus the affair was staged as a "two-ring circus," as stated by Secretary Meserve, and an additional dining room secured to take care of the additional guests, the speakers delivering their addresses in both rooms.

Robert Amory acted as toastmaster at the banquet, and himself made a forceful talk, dealing with a number of subjects of acute interest.

Mr. Amory dealt with the economic value of the cotton mill industry in this country in raising the standard of working conditions, declaring that the introduction of the modern cotton mill intervened as a preventative of a "sweat shop" industry.

Address by President Amory.

"The development of the cotton mill in England and this country," said Mr. Amory, "marked the 'so-called industrial revolution.' The cotton mill, in fact, led the way in the modern method of production in factories. If the growth of population of this section had continued without the factory, undoubtedly cities would have sprung up in time as in Europe during the same period. The home industry of spinning and weaving in the farmhouses would have been transferred to cities. With a constantly increasing population in cities without factories, the goods would really have been produced in what we would now call sweat shops. The modern cotton mill has prevented this development of such a sweat shop industry.

"With the improvement of machinery, the women, who formerly worked at home from dawn to dark spinning and weaving by manual labor, have gone into the mill to do the same work rendered easier by machinery. Here in the mill the manual labor of the old days, or the larger part of it, is performed by power and many of the motions formerly made by muscular efforts are now made by automatic machines. Great cities have sprung up, for people seem to prefer to herd together rather than live isolated lives. Stop and think what these cities would have been without the development of the factory and machinery; how hard the living conditions, how much harder than in the warm, ventilated, well lighted and power-driven mills.

"Some unthinking people claim that women should not work in a factory, but, before the factory, women and children worked like slaves to produce the barest, scantiest necessites for the family, such as clothing. Now children do not have to work. The women, who work in the factories, have an infinitely easier task than those who tried to accomplish the same thing but without fit tools. The development of machinery has made it possible to produce many more goods with much less work. The worker has much more leisure and certainly many more of the comforts, not to say, luxuries, of life. This leisure gives the average citizen the spare time which has made possible modern education, sanitation and the health work which have so reduced illness and suffering and increased the average length and happiness of the human life. It is important to realize that these things are made possible by increasing production due to the modern factory. It is important to see that the leisure time, thus provided the worker, is used to advantage and not wasted.

"Sometimes too much credit is given to legislation for these accomplishments and too little to invention. Before the age of invention and machinery, people could not find time nor power to do these things for all their efforts were used in producing the barest necessities.

"In considering this type of legislation it must be fully appreciated that different kinds of work produce different effects on the worker. Some tasks can take longer than others with the same total effort. Some work can be done by women and some should not. Of all the tasks fitted for women those of spinning, weaving, knitting and sewing are the most suitable. It has been theirs since the beginning of the world. By their nature these tasks are the least fatiguing and require the nimble fingers and gentle touch of women. This opportunity for women should not be curtailed.

"The New England states depend on their textile business, particularly cotton," continued Mr. Amory in directing his remarks to the importance of unhampered manufacture, "and we must work hard to keep the industry growing and maintain our place. We must oppose with all our power unreasonable and artificial handicaps, such as undue shortening of hours, etc.

"Undue restriction by legislation apparently operates to make the work more intermittent and handicaps the worker even more than it does the thousands of stockholders. Massachusetts in the last four months has operated only 91 per cent of full capacity, while every other section of the country has been running full time and many sections extra shifts."

Mr. Amory then pointed out that decreasing the hours of operation of cotton mills actually reduces the production per operative and therefore raises the cost of cloth and yarn; the production per hour remaining practically constant. He quoted from an article by Harold Cliff, secretary of the Oldham Master Spinners' Association, of Oldham, England, which stated that the reduced production brought about by a reduction of the work week from 55½ to 48 hours was equal in percentage to the reduction in

hours; more, in fact, because the operatives insisted on larger time allowances for cleaning, oiling, etc. Nor did the reduction in working hours increase the productive capacity of the workers, said Mr. Cliff.

Mr. Amory added to this that no reliable facts had ever been presented to uphold the incorrect statement often made that production per hour increases through shortening the hours.

The concluding thought in Mr. Amory's remarks was that the mills should advertise their plants and their products more, by putting signs on the mills, and other methods. He pointed out that most of the mills in the industry have grown so quietly that sometimes even the community around them does not appreciate their size and importance. Most of the mills, he pointed out, do not even have signs telling their names or products. "As managers of these mills," he urged, "it is time this state of affairs was corrected. Put signs on your mills and tell the world, and especially your own community, what products you make. Take your citizens and your chambers of commerce through your mills sometime. Talk up your mill in your home town."

C. E. Hutchison, president of the American Yarn and Processing Company, Mount Holly, North Carolina, who is president of the American Cotton Manufacturers' Association, spoke at the banquet in that capacity and brought greetings from the American Association, expressing the hope that the two associations would constantly increase their contact and friendly relations.

Senator Henry F. Lippitt and W. S. Kies, chairman of the First Federal Foreign Banking Association, New York, and W. L. Clayton, of Anderson, Clayton & Co., were the other speakers at the banquet.

Thursday, the final day of the convention, included trips to manufacturing plants in the vicinity of Providence, and a delightful luncheon and clambake at the Pomham Club on the Providence River.

The affairs of Thursday brought the convention to a close, and the recollections of it on the part of those who attended are universally pleasant and agree that the occasion was one of the most satisfactory meetings of the Association, due to the untiring and painstaking efforts of the entertainment committee and the arrangement committee of the Association.

Brazil---The Promising Land*

BY W. IRVING BULLARD.†

Where will the world turn to avoid a cotton famine? Is not the answer, Brazil? No other candidate, among all the sources sought by the cotton spinning countries of the world, with great effort but little result to date, can rival the possibilities I have seen in our South American neighbor.

Brazil is frequently and truly termed a "promising" land. There is the vast and sure promise of nature, waiting only development. Capital and population will gradually attend thereto. Experience and the tutelage of outside capital and advice—especially American—should gradually aid in the way of executive direction of finance and business. The rich and real promise of the land itself stays assured; and undoubtedly its greatest meaning, for the world as well as for Brazil, is in cotton.

Conditions and tendencies the world around, but particularly in the leading nations that raise or spin cotton, point irresistibly to that conclusion. In an era when the world need of cotton continues steadily to expand, and when the uses of cotton keep on multiplying, the old sources of supply are shrinking. The United States, under the yet unconquered sway of the boll weevil, appears to have entered upon a period of short crops. The past few years have seen large fluctuations in the Egyptian crop, with a general trend toward smaller total production and lower yield per acre. India seems unable to improve in quantity, and more especially in quality, of output. Efforts to raise cotton elsewhere in the British Empire have as yet had but trifling results. And the pressure converges most on staple cotton such as Brazil could produce economically.

Here is where Brazil enters the picture, with a double role to play. Nature has given to Brazil the proved capacity to produce great crops of high grade cotton and more than 75,000,000 acres of uncultivated land adapted for cotton. Both soil and climate ensure success. In Brazil also are the beginnings of what should prove a large textile industry, to absorb a part of the yield of the vast fields available.

In a double sense this has a future significance for our American textile industry. It means another source of raw cotton supply, not rivaling but supplementing our own South. It means also a large potential market for textile machinery and supplies manufactured in the United States. To outline these dual opportunities, as they appeared to me on a recent survey of conditions in Brazil, is my aim today.

There is much misconception of Brazil—as a purely tropical land given mainly to raising rubber and coffee. The jungle fringe is only along the northern coast. Most of Brazil, which in its area is almost as large as the United States minus Alaska, is a plateau from 1,500 to 3,000 feet high, stretching southward almost 34 degrees from near the equator. The Republic has more than 15,000 miles of railroad and more navigable rivers than any other country. More than 10,000 miles of waterways are open to river steamers and ocean-going vessels and 20,000 miles additional which are navigable for light-draft and flat-bottom boats.

Brazil's great need—beside capital—is population. With slightly less than 30,000,000 people, there are not quite ten inhabitants per square mile. But native fecundity and immigration—which in coming years is apt to be stimulated by our own change of immigration policy—should quickly expand the population. Development of the country's rich resources by influx of capital and population should meet the other great need—the raising of wage and living standards. Already the efforts of both the government and industrial interests, especially textile, are begin-

†Treasurer National Association of Cotton Manufacturers, Vice President Merchants National Bank of Boston, Vice President and General Manager The E. H. Jacobs Mfg. Co., Danielson, Connecticut, Official Delegate representing American Textile Industry at the International Cotton Conference at Rio de Janeiro, October, 1922.

*Extracts from an address before The National Association of Cotton Manufacturers.

ning to reduce the 80 per cent of illiteracy.

Cotton is actually indigenous to Brazil—found growing wild on the mountains. Our Civil War spurred Brazil into exporting nearly 400,000 bales. But it lapsed back into rubber and coffee; and in recent years, in a time when export increase was Brazil's great need, the country suffered from this dependence on only two staples. It has lost the primacy in rubber; and it has profited less lately from coffee. Meanwhile its cotton possibilities lay neglected.

Brazil's cotton department in the agricultural ministry is but three years old. Its cotton is excellent in quality in spite of an almost appalling ignorance of the planters—as to seed, cultivation, qualities, etc. As yet there has been little organized effort to improve tillage or ginning or marketing.

Sowing and picking and handling are alike primitive and careless. Many planters, with whom cotton is but a side issue, seem not to know that length or texture are market or price factors. Much of the cotton in Brazil is sold locally at a uniform price, quite regardless of quality. There is indiscriminate mixing of seed. There has been quite as much carelessness in grading and baling. Brazil, somewhat like India, has paid little heed to separation of staples, to sorting the long staples from the short, the high grades from the low.

Yet, in spite of all these obvious drawbacks, which have retarded the entry of Brazilian cotton into world markets and probably have cost Brazil much needed millions, the fact is that the better product of Brazil will even today rank well up with that of Egypt or Arizona. The yield per acre, under careless methods, is greater than can be claimed for any other country. And the area available for cotton is greater than that of our own cotton belt.

Brazil is now raising about 600,000 bales of cotton a year, when under the stimulus of world need and price it might well be raising tenfold that total. Already, under a slack technique of cultivation, more than a quarter of the crop averages 1⅛-inch or better staple. The average production is about 200 pounds per acre from perennial cotton and double this poundage from annual plantings, with many instances of much higher yield under anything like careful cultivation.

Brazil, however, is waking up to its opportunities in cotton. Two surveys of the entire field by British officials of the International Cotton Federation, and the holding of the International Cotton Conference at Rio de Janeiro in connection with the Centennial Exposition, at which I had the honor of representing the American textile industry, have accelerated that awakening. The present government, whose minister of agriculture presided over the Cotton Conference, and whose chancellor of the exchequer as well as the president, is keenly interested in cotton, has determined to do all it can to aid in the segregation and improvement of seed and the betterment of ginning and grading. The President in his first official speech expressed the purpose of making cotton rank with coffee as a product of Brazil.

In consequence of such stimulus, as well as that of the world market situation in cotton, the present growing crop in Brazil will probably set a new record. In Sao Paulo, one of the three northwestern states most suitable for cotton raising, the yield is expected to be three times as large as last year's. The crop in other northern states will also surpass former figures. Today more Brazilian than Indian cotton is going to Lancashire.

In large part this progress is due to adoption of better methods. Sao Paulo has copied the organization of Liverpool and has hired a Liverpool grader. The cotton states are picking and handling cotton in more modern ways. And, what is most needed, seed farms are being established in the cotton states of Brazil.

Good, selected seed is probably the main need. In such experimentation and betterment work the federal and state governments of Brazil seem disposed to aid materially.

Likewise they can and doubtless will aid in the establishment of modern ginning plants. Today there are no roller gins in Brazil, and most of the old-fashioned gin saws have not been sharpened for years in the average Brazilian gin. After a few years of government encouragement it is likely that private enterprise will provide modern ginning and oil plants.

Plant selection, through the agency of seed farms and specialists sent out by the government, is Brazil's first need, to take advantage of its magnificent natural opportunities. Clean instead of careless picking and grading come next. The differential between the price of clean cotton and of dirty cotton has sometimes ranged up to 100 per cent in the world's markets. And the saw gin, unsuited at its best for long staples—and rendered vastly less efficient in Brazil by unsharpened blades—should be supplanted by the roller gin.

Given a few relatively simple reforms of process, there is no reason why Brazil should not soon contribute a million, then five or more million, bales of high grade cotton to the world's markets. So far it has been little hurt by insect pests. It has the pink boll weevil from Egypt. But fumigation, netting of the butterflies and particularly the spreading of the seed in the sun seem to minimize the harmful effects. Paris Green appears to take care of the cotton worm.

These considerations appealed strongly to the International Cotton Conference in Rio last October. After recording its firm opinion that Brazil "should prepare itself to take position in the great buying markets of the world, becoming their constant and regular supplier," the Conference outlined several suggestions for improvement of methods. In brief, these included:

> Intensified study of cotton culture in agricultural schools and other teaching establishments of elementary, intermediate and higher grades.
>
> Experimental and demonstration establishments, especially with view to improving Brazilian varieties of cotton.
>
> A seed farm for every zone in each cotton state, farmers buying the seed and agreeing to plant none other.
>
> Fibre of American type—1 1/16 to 1 1/8 inches—be increasingly grown, with no detriment to production of longer staples.
>
> Use of modern implements, the states to learn by experiment which are most suitable, and to provide facilities for purchase.
>
> Federal government and states to determine which fertilizers are best adapted, control the trade in fertilizers and aid in purchasing.
>
> Instead of careless picking and storing, resulting in less than the best prices in world markets, means should be taken to ensure commensurate value to growers of clean cotton.
>
> Advantages of cotton culture should be used as a means of attracting immigrants.

In the cotton area of Brazil there are but two seasons—dry or summer and rainy or winter—the latter running from January to July. Cotton planted at beginning of winter gets abundant moisture, finishing its growth as the rains end. Then the hot sun vivifies the plant. This hot

(*Continued on page 668.*)

The Effect of Moisture in Cotton on the Efficiency of the Opening Process

BY R. BIGHAM SMITH.

Raw cotton in bales as delivered to mill warehouses contains on the average about 50 pounds of water per bale, or about fifteen dollars worth at present prices. From the standpoint of weight, it will be very much to the manufacturer's interest to see that he sells this much water in every 500 pounds of finished goods. While the importance of the manufacturer selling as much moisture as he paid for in his raw stock makes most of them spend the money for humidification, it is, in reality, a secondary matter. That is, the added value due to the quality of the yarn containing the requisite moisture is more important than the extra weight. Yarn in which there is a normal moisture content will be found to have about 50 per cent more strength than bone-dry yarn. Whereas, if it were possible for the purchaser to secure his yarn bone-dry and then moisten it, he would make an extra 8½ per cent on the transaction. The point is that moisture adds quality as well as weight.

The desirability of moistening cotton to restore it to its natural condition is no longer a subject of argument. The opinion of mill men, however, differs as to the proper method of restoring the moisture and how much to restore in each process of manufacture. The opening process is the operation in which moisture first enters into the problem of manufacture. Here, also, is where most of the moisture is ordinarily removed by the machines doing their part of the textile work. The fanning action and heating action of the opening machines is probably greater than any of the following machines. This results in a great deal of the moisture being evaporated from the stock before it reaches the cards.

Humidification engineers have always contended that there should be no attempt to humidify the opening and picker rooms, their reason being that it is desirable for the cotton to be fairly dry before the foreign matter can be best removed. With the present opening room practice it is necessary to have some moisture in the cotton—about half its normal content—in order for the fiber to endure the terrific punishment to which it is subjected by the beaters. It is unquestionably true that the dirt and trash are separated with better results when the fibers are dry than when they are moist. If we are so unfortunate as to have mud splashed on our trousers and attempt to remove it while it is damp, we know how it is rubbed in even more securely by our efforts. If we hang the trousers up to dry, though, we find the mud easily removed by more or less gentle dusting. This method of removing foreign matter is just exactly what we should strive for in our opening room.

Recently there has been announced a new process for cleaning cotton. This process, developed by Mr. Wadsworth, takes advantage of the well known fact that dry cotton separates from dirt, trash, and seed more easily than does damp cotton. The Wadsworth process consists of an opener, a dehumidifier or dryer, a cleaning mechanism and a moistener. The cleaning mechanism separates the foreign matter from the stock in a gentle manner and the injury to the stock is therefore reduced to a minimum.

Assuming that the baled cotton has about a ten per cent regain as we take it from the bale, it should be very greatly reduced in moisture content before it reaches the openers. It is an old idea to have large bins in which the cotton from a number of bales is mixed and stored. Here the cotton has a chance to readjust itself from the matted condition of the bales. Mills using a mixture of several grades or colors of cotton have found it best to have the bales first mixed by hand in one of these bins or rooms and then fed to the bale breaker. This gives better results than having the various bales opened and depending upon opening room help taking the same amount from each bale and putting it on the apron of the opener. It will be an easy matter to take advantage of the dry cotton theory for the opening rooms and also gain better mixing with the use of large storage space for the cotton after it is removed from the bale.

The writer is sure that it will prove a feasible and profitable investment for cotton mills to build a fireproof storage room in which to allow their cotton to open and dry out some of its moisture. This room should be provided with ventilators in its roof and should be steam heated by means of radiators or pipes around its walls. In this room a mixing for several days run could be stored. It would be possible to have the room divided in two sections and in this manner a mixing would be in process of drying out and opening itself all the time.

If we deliver the cotton to the openers with only a small amount of its original moisture, the cleaning can be accomplished with less beater effort. This will result in less damage to the staple. The stock will be just as effectively cleaned without damaging so many fibers and a better strength will be secured in the finished goods. The theory may be advanced from this conclusion that since the pickers can clean dry cotton better, why not the cards, also? The cards have a more important purpose than cleaning. They parallel the fibers and also remove the short staple. The parallelization of the fibers would be hindered if the cotton were insufficiently moistened. Furthermore, the web would be constantly splitting and breaking down. It is therefore apparent that the cotton should be thoroughly conditioned in order to be efficiently carded.

The use of atomizers for spraying moisture directly upon the lap seems to be a very much neglected field. This application, however, is certain to increase in the near future, due to the proven fact that cotton should be dried out before being subjected to the cleaning process. It is absolutely necessary to restore the moisture to the stock before it is carded, and dependence upon the humidified air of the card room will prove inadequate. It will therefore be necessary to apply moisture directly upon the lap before it is placed on the cards. The reason for this statement is that the dense nature of the cotton when rolled into a lap precludes the possibility of penetration taking place in the short while the lap is exposed, before being carded. It is quite desirable that the moisture be restored before the cards parallel and clean the fibers, for otherwise

this machine will not perform its work in an efficient manner. The web leaving the card is in the ideal form for receiving and absorbing moisture from the air. Indeed, in none of the following processes is the cotton in such favorable condition for moisture absorption.

A high moisture content in the card sliver is important for another reason. It is generally agreed by all authorities that cotton (or any other textile fiber) processes better when it contains its normal moisture content. By normal moisture content is meant the content of moisture by weight absorbed by the fiber in average relative humidities. For cotton this is considered to be 8½ per cent, which is the accepted standard. William D. Hartshorne, one of the foremost authorities on moisture in textile mills in the world, believes that the material should be constantly giving up moisture throughout the process of manufacture. Some authorities (Stuart W. Cramer among others) consider the best condition of manufacture existing when the moisture content is kept fairly constant throughout the various processes, after the cotton is opened and cleaned. Certainly the stock should leave the cards with at least the normal regain of 8½ per cent. This will require that the laps be subjected to a high degree of relative humidity in the atmosphere or else have moisture sprayed directly upon them. It will be much more economical to spray the moisture directly upon the lap and the stock will be in better condition for further handling. The adjustment of the spray heads can be made after some experimentation. A little excess moisture will not matter, for the stock will adjust itself before the manufacturing process is complete.

One of the large machinery manufacturers markets a soaping attachment which applies a soap solution to the stock as it passes from the calender. This machine consists of a cylinder revolving in a tank; while directly above the cylinder rotates a brush which rubs its bristles against the surface of the cylinder, and thus brushes the solution off in fine particles on the stock below. A device of this nature could be used in the place of the atomizers. The soap solution is generally restricted to short staple manufacture and waste mills, to aid in holding the short fibers together in the lap and the prevention of fly. This also results in less waste. Such a practice is really capable of some development in the cotton mill industry. The woolen mills are very skillful in the use of oil emulsions on their stock. If an emulsion of oil is sprayed upon cotton stock it will be found to aid materially in the carding as well as to reduce flyings. The choice of the emulsion to be used will require considerable care. The oil in the emulsion should be used quite sparingly and should be of such characteristics as not to cause any gumming or sticking in the stock or on the machinery. Sulphonated vegetable oils will not be found entirely satisfactory, since they have a tendency to become sticky. The best emulsion to use will be an oil which will not turn rancid or change in chemical composition in future operations. The oil used should be such as not to interfere with any later finishing processes. A chemically inert oil, readily soluble or emulsifiable in water, free from color or odor, that can be readily removed by rinsing or will not interfere with the subsequent processes, will be the required oil.

It will be observed that the writer has been attempting to interest mill managers in trying to increase the use of equipment already on hand and take advantage of proven methods of cleaning cotton without purchasing new machinery. In other words, it has been known for some time that dry cotton cleans better than moist cotton. Furthermore, all carders and other mill men know that the less beating to which the stock is subjected, the better it is for the ultimate strength of the goods. It will therefore be quite practical to utilize these two facts and secure better strength with no sacrifice in cleanliness. To do this will require that cotton be thoroughly aired and artificially dried before being fed to the openers. Then, to avoid injuring the dried stock, the beater action should be lessened. The result will be an equal cleaning and less damaging of staple. The question comes up as to just how much the beaters are to be slowed down or what machine is to be changed or how many pickers are to be used, etc. To this it must be replied that the mill manager, himself, will have to experiment to determine just what will be best in his individual case, for no hard drawn rule can be universally employed. The modern cotton mill is well equipped in brains and the live superintendent will find that he can take advantage of many improvements and new processes by making changes in equipment already at hand without any great additional investment.

Chinese Cotton Consumption.

Chinese mills consumed, during the half year from August 1st, 1922 to January 31, 1923, 492,162 bales of cotton of 500 pounds each, against 394,689 bales for the half year ending July 31, 1922; 349,387 bales for the six months ending January 31, 1921.

The consumption of American cotton has been less, owing, no doubt, to the high prices commanded by this staple. The Chinese mills during the six months ending January last used 58,115 bales of American cotton while in the previous half year the consumption was 82,956 bales, and 71,970 bales during the six months ending January 31, 1922. In the first six months of 1921 the Chinese mills used only 20,804 bales of American cotton.

Although a smaller amount of Indian cotton has been used by the mills of China during the past six months, the average is much higher than in the previous semi-annual periods for which statistics are obtainable. The figures are: Six months ending January 31, 1923, 135,330 bales; half year ending July 31, 1922, 187,951 bales; six months ending January 31, 1922, 110,314 bales; six months ending July 31, 1921, 67,718 bales; and the half year ending January 31, 1921, 51,311 bales.

Egyptian cotton has been consumed in greater quantity, 2,569 bales against 708 bales in the previous six months ending July 31, 1922.

U S Bobbin & Shuttle Company, Providence, R. I. have secured Matt Ousley, of Greenville, S. C., and Dillon C. Ragan, of High Point, N. C., to represent them in the southern territory on their products. Messrs. Ousley and Ragan recently made a visit to some of the plants of the company to thoroughly acquaint themselves with the details of manufacture of the products and to better equip themselves for rendering the most efficient service to customers of this large and active organization.

Finishing Cotton Bag Goods

By WILLIAM B. NANSON

There is a popular supersition extant that the bleaching of cotton for flour bags is a matter of small importance and that any old way will answer, just so the goods are made reasonably white at a low cost; a larger production at a low cost being the main, and in fact, the only consideration.

Some day it may dawn upon the mind of some more enlightened mill executive that quality, or rather a reputation for quality, earned by consistent and continued superiority of general results, may yield larger and more satisfactory ultimate dividends than those gained by rush methods and an apparent rather than a real low cost production.

The main idea in these strenuous times appears to be to cut down the boiling and handling in the bleach-house and to depend upon the chemic to do it all. Now the chemicking, which is the most expensive item in the bleach-house, does nothing to the goods that is really beneficial, and it acts on the goods like the cosmetics on a lady's face—that is, it is for outside show—it covers up the defects temporarily without improving the complexion beneath.

The success of bleaching, printing and finishing, all three of which are involved in the bleaching, starching and printing of bag goods, depends largely upon the preparation of the cloth in the bleach-house previous to the chemicking, and not on the chemicking itself. Unless the goods are thoroughly "bottomed" they will not stay white, especially when "filled" with China clay as bag goods are; moreover, they will not absorb either the starch in the finishing, which will make them "dusty," or the moisture in the calendering or the colors in printing. Again, poorly bottomed goods finish soft and sleazy.

Since the advent of the substantive colors in dyeing, the "one boil in caustic" system of bleaching has come to stay and give delight to the soul of the efficiency expert who sits in the office. It is to be noted here that efficiency, as understood by these so-called experts, simply means more production at a lower cost—the question of quality cuts no ice with them, they are simply hired to cut down the cost and increase the production and the man in the mill who can achieve some obviously present economical result at the expense of a probable future kick from some long suffering customer, is the man for them; he is metaphorically making two blades of grass grow where only one grew before, and this is very obviously efficient efficiency; it is palpable, one can feel it, and see it, and hear it, so to speak, and moreover, it can be seen on the books, and it can be made into a report, and it can be read before a solemn board of directors, and put on the minutes with a vote of thanks and a probable raise in salary. But the quality? Pooh! An ephemeral thing that can't be figured in either yards, pounds, or dollars and cents and the man in the mill who only improves the quality will "starve in a garret and die neglected;" "for him no minstrel raptures swell;" etc.; etc.; there are lots of other quotations quite applicable to this cause.

However, *revenons a nos moutons*, as our French friends say—let's get back to our mutton. Where the pressure kier is in use we strongly advise the lime boil for the first step in the bleaching of bag goods; it does away with any initial steeping of the goods and at a pressure of 15 to 25 pounds its saponifying power is far greater than that of caustic soda, in fact some of the oils and fats in the cotton cannot be saponified by soda at all. Where the low pressure or open kier is in use the caustic soda system may be better or at any rate do quite as well.

I give herewith the system of bleaching 12 x 12 (i. e., 44 x 48 American style of counting) bag or similar goods at one of the leading bleacheries abroad:

Run the dry pieces through milk of lime in a liming machine or preferably a washing machine, using 125 to 150 pounds of lime to the ton of goods, direct into the kier. Boil for eight hours at 20 pounds pressure, then wash off in the kier. Wash out of the kier and sour for two hours in hydrochloric acid at 2 degrees Tw. Wash well and give an intermediate chemicking at ½ degree Tw. Wash well and boil six hours at 10 to 15 pounds pressure in 50 pounds of soda ash (three-ton kier). Wash well from the kier. The goods should now be white and absorbent, but it is customary to pass the goods again through the chemic at ½ degree Tw., lie for two hours and sour in sulphuric acid at 1 degree Tw.

A first-class white can be secured this way, and at a low cost, as all the chemicals are used very weak. The intermediate chemic can be dispensed with but not so well, as the goods will require both a stronger chemic and a stronger sour in the final chemicking and souring and will not be so absorbent, therefore they will not take the starch and clay filling nor the print colors so well. I might say here that the second boil in the soda ash could be accomplished in an open low pressure wooden kier if necessary, as the function of the ash boil is merely to dissolve out the easily saponifiable fatty acids left in the goods by the previous liming and souring operations, and to emulsify and remove the unsaponifiable oils and fats. What has happened to these goods is simply this: the lime boil has saponified the saponifiable oils and fats converting them into insoluble lime soaps and the unsaponifiable oils and fats remaining unchanged. The subsequent souring and washing decomposes the tannates and they wash out, it also decomposes the insoluble lime soap into a soluble lime salt of hydrochloric acid which the washing removes, and saponifiable fatty acids, which are left in the goods. These fatty acids are subsequently converted into a soap by the action of the soda ash which is easily removed by the subsequent washing, moreover, these unsaponifiable fats mentioned and which were left in the goods after the lime boil, being emulsifiable in soda ash, are emulsified and washed out at the same time.

It will be seen from the foregoing, the difficulty, if not the utter impossibility of properly bottoming a piece of cotton cloth with one boiling in any chemical, though lime will possibly come the nearest to it of anything, and, if a one-boil process is to be adopted it is better if carried out with lime instead of soda.

The lime boil requires experience and careful and skilful management; there are many things that can happen to

(*Continued on page 700.*)

What the Southern Mills Are Doing

Liberty Cotton Mill Company, Clayton, N. C., which recently increased its capital stock to $300,000, has awarded contract for the construction of a mill building to house 5,000 spindles and accompanying equipment for the production of cotton yarns. The building will be 104 x 135 feet. Officers of the company are C. W. Horne, president, J. D. Barbour, vice president, D. L. Barbour, secretary and treasurer, and A. C. Atkinson, manager.

A new cotton mill is to be erected by the Rhodes-Rhyne Manufacturing Company, at Lincolnton, N. C. The officers will be D. P. Rhodes, president and treasurer; D. E. Rhyne, vice-president, and Paul Rhodes, secretary.

The Stonecutter Mills, Inc., Spindale, N. C., will make an addition to their plant which will double the capacity of the mill. The addition will be 175 x 400 feet, and will house 504 new looms, making a total of 1008 looms when the entire plant is completed.

Belle-Vue Manufacturing Company, Hillsboro, N. C., will enlarge their plant, adding approximately 200 looms, and will also extend the dye house. A two-story slasher, cloth finishing and storage building will be erected, and a mill addition will provide space for 5,000 additional spindles. J. E. Sirrine & Company, Greenville, S. C., are the engineers.

A tract of over 1,300 acres of land has been purchased by the Proximity Manufacturing Co., Greensboro, N. C.

Superior Yarn Mills, East Monbo, North Carolina, near Statesville, N. C., have been purchased by the Southern Power Company, at a consideration of $600,000. It is stated that the power company made the purchase in order to carry out its plans at some future date of developing the water power site owned by the mill. The plant will continue to operate with the present mill officials in charge, it is stated. These mills were organized several years ago by R. L. Stowe and associates, of Belmont, N. C., who purchased the plant from the Turner interests of Monbo. The plant has 10,000 spindles and makes combed yarn.

Caldwell Cotton Mill, Lenoir, N. C., will build a one-story spinning mill, with 6,000 spinning and 3,000 twister spindles and necessary preparatory machinery. A village and warehouses will also be built. R. L. Gwyn is treasurer, and J. E. Sirrine and Company are the engineers.

Audrey Spinning Mills, Weldon, N. C., have been organized with a capital of $225,000, by George C. Green, of Weldon, George Thomas and H. Ray Page, 1 Madison Avenue, New York City.

Phenix Mills Co., Kings Mountain, N. C., is displacing some of their old looms by the installation of new Draper looms.

The new building of the Amazon Cotton Mills, Thomasville, N. C., will be 488 x 132 feet, two stories for half its length. A large picker room will also be built.

Carolina Cotton & Woolen Mills Company, Spray, N. C., has let contracts for the erection of 85 new dwellings.

Erlanger Cotton Mills, Lexington, N. C., plan the enlarging of the storage room and the construction of an addition to the opener room.

The Elmira Cotton Mills, Burlington, N. C., will build a new addition to be 115 x 168 feet, saw-tooth roof. Two hundred additional looms and carding and spinning machinery will be installed, and an addition made to the dye plant. Twenty-five dwellings for operatives are being erected.

Contract has been let for the additional plant of the Leward Cotton Mills, Worthville, N. C. It is to be 85 x 161 feet, two stories, with a one-story extension 45 x 42 feet. Spindles and looms will be installed. Lockwood, Greene & Co., Boston and Charlotte, are the engineers.

Ponemah Mills, Inc., Lexington, N. C., has been organized for the manufacture of yarn. The mill will be a brick and steel sash building, 50 x 100 feet, and orders have been placed for machinery. The initial installation will be 1,000 spindles.

A total of 110 houses for workers are planned for the plants of the Woodside Cotton Mills at Simpsonville and Liberty, S. C., and contracts for the dwellings, 75 at Simpsonville and 35 at Liberty, have been let. The new houses are to be of modern type and construction, some four rooms and some six rooms .

The new building to house the additional equipment planned by the Lydia Cotton Mills, Clinton, S. C., will be 280 x 125 feet, three stories high, it is announced by Lockwood, Greene & Co., engineers.

Minter Homes Company, Greenville, S. C., will build thirty cottages, containing four and six rooms each, in the village of the F. W. Poe Manufacturing Company, Greenville.

It is announced that a two-story office building will be erected for the office force of the Hawthorne and Hampshire Mills, of Clover, S. C.

A new cotton mill at Sharon, S. C., is proposed in which Lockhart Mills Co., of Lockhart, S. C., are interested. The proposal is to build a mill capitalized at $500,000 or $600,000, with a part of the capital raised locally. In the event the mill is organized, an electric power line from Lockhart to Sharon will be constructed.

Hartsville Cotton Mill, Hartsville, S. C., plans the rearrangement of the opening and picking machinery, and the addition of new carding, roving and spinning equipment. J. E. Sirrine & Company are the engineers.

Newberry Cotton Mills, Newberry, S. C., have awarded contracts for new machinery including 15,000 spindles and 50 40-inch looms.

Daniel Morgan Mills, Cowpens, S. C., manufacturers of bed spreads, are planning the installation of additional looms. J. C. Mason, of Kings Mountain, is president.

Dunean Mills, Greenville, S. C., have awarded contract to the Gallivan Building Company for the construction of the new weave shed. The construction in the new building will duplicate that of the present weave shed—brick and steel sash in side walls and saw-tooth roof. The mill will install 600 new Crompton & Knowles looms, making a total of about 1,800 looms. Spinning will be operated day and night and the weaving in daytime only. Other construction by this company includes the new twister building, Fiske-Carter Construction Company, contractors, which is nearing completion, and 250 houses in the village, for which

W. M. Welch has the contract. J. E. Sirrine & Company are the engineers on this expansion work.

The Laurens Cotton Mills, Laurens, S. C., have announced tentative plans for the erection of about 15 or 20 new houses. The additional housing facilities are made necessary by the increased number of operatives needed in the manufacture of the higher grade of cloth now being produced.

Oakland Cotton Mills, Newberry, S. C., have taken steps looking toward the ultimate doubling of their mill. Lockwood, Greene & Co., Atlanta and Boston, are supervising the work of the two additional sections now being added to the present two-story warehouse, each of which is 50 x 100 feet. The opening room is also being enlarged and increases in the village and other extensions are under consideration.

Graniteville Manufacturing Company, Graniteville, S. C., are reported to be considering the erection of a new mill and the conversion of a present plant into a bleachery.

A new finishing room is being constructed at the Haynes Mills, at Avondale, N. C. The new addition will be 175 x 75 feet, and will be utilized in finishing the cheviots produced at that mill.

Bradley Manufacturing Company, Columbus, Ga., have awarded contracts for considerable new machinery to replace old equipment. The new machinery includes 30 cards, 36 spinning frames and four winders.

A sixteen-room school building is to be erected by the Bibb Manufacturing Company at Porterdale, Ga. The grounds at Porterdale are being extensively improved with sidewalks, storm sewers, and general beautification.

An addition to the filtration and pumping plant is being made at the Riverside & Dan River Cotton Mills, Dan River Division, Danville, Va. When completed this plant will have a capacity of 4,500,000 gallons a day, and a storage capacity of 3,000,000 gallons of filtered water. Machinery is being installed in the new finishing building just completed, which is five stories, 350 x 150 feet. Lockwood, Greene & Company are in charge of the work.

The plant of the Hamilton Carhartt Mill No. 2, at Mobile, Ala., was recently sold to J. W. Sanders. The intention of the new owners is to enlarge the plant and make extensive improvements in the machinery, it is reported. Mr. Sanders controls mills at Jackson, Miss., Meridian, Miss., and other points in the South.

Tennille Yarn Mills, at Tennille, Ga., have been purchased by new owners, who have taken the plant over under the firm title of Washington Manufacturing Company. The property is being thoroughly overhauled, beginning with the reservoir and extending to the spinning room, where mule spinning has been discarded and ring spinning substituted. An addition 56 x 200 feet is to provide for a weave room, and about 100 new looms will be installed, as well as new warping, beaming, quilling, spooling and cloth room machinery. The mill will manufacture medium and heavy duck. J. E. Howell, formerly of La Grange, Ga., is acting superintendent in charge of this work, and is assisted by D. C. Anderson, formerly of the Dixie Cotton Mills, at La Grange, who is the overseer of carding and spinning; Waymon English, of Anderson, S. C., who will be in charge of the weaving, and A. J. De Medicis, formerly of La Grange, who will be master mechanic. The village is being renovated and houses re-painted and repaired.

The Eastman Cotton Mills, at Eastman, Ga., are reported to be planning the erection of a community house in the village.

The Manchester Manufacturing Company, Macon, Ga., have purchased two new boilers for the steam power plant, and have completed the installation of new manufacturing machinery which increases the equipment to 11,908 spindles and 72 cards.

Micolas Cotton Mills is the name of the new cotton mill recently organized at Opp, Ala., by C. M. Mizell, C. H. Cole, and Mrs. A. S. Douglas and others. The mill is to have 7,200 spindles and 190 looms. Robert & Company, of Atlanta, are the engineers.

J. R. Miller and associates, of Oakland, California, who purchased the Rabell Mfg. Co., at Selma, Ala., have more recently bought the Selma Manufacturing Company, at Selma. The plant of the Selma Manufacturing Company has 16,000 spindles and 340 looms manufacturing cotton bags and heavy osnaburgs. It was purchased from J. F. Ames, manager, who announces that he has plans for a plant to manufacture bags. The deal was handled by C. K. Taylor, of McComb, Miss. E. E. Hendrix, manager of the New Canebrake Cotton Mills, at Uniontown, Ala., which is also owned by the California interests, will have charge of the two plants at Selma also, which will be known as the Sunset Mills No. 1 and No. 2.

Fifteen houses are to be added to the village of the Camperdown Mills, Greenville, S. C. They will range in size from three to five rooms each.

The International Cotton Mills will proceed immediately with the erection of a large new plant on property already owned by the company at Hogansville, Ga., it is announced. The new mill will probably be known as the Stark Mills and be used for the manufacture of tire fabrics in the South and for making some of the products formerly made by the Stark Mills at Manchester, N. H., says the statement. The construction work will be started immediately under the supervision of Lockwood, Greene & Co., engineers of Boston and Atlanta, and it is expected to have the mill producing goods by the end of the year. The new mill will be of concrete construction, with about 250,000 square feet of floor space.

The expansion work at the Walton Cotton Mills, Monroe, Ga., requires the widening of the present mill from 100 to 150 feet, the construction of a new weave shed and cloth room, new opener room, the doubling of the present warehouse and the building of 30 or 40 new cottages, according to Lockwood, Greene & Co., who are the engineers for the work.

Contract has been let for a four-story addition to the No. 2 plant of Grendel Mills, at Greenwood, S. C. The new building will house practically 20,000 spindles, virtually doubling the capacity of the mill. The outside dimensions are 132 x 180 feet. It will be of the latest type of ap proved mill construction. J. E. Sirrine & Company are the Engineers.

The extension plans of the Dunson Mills, La Grange, Ga., call for a two-story addition to the weave shed, approximately 150 x 300 feet; the erection of a two-story brick picker building, and a two-story brick spinning plant.

Approximately $500,000 is being spent by The Trion Company, Trion, Ga., for the improvement and enlarge-

ment of the town; this includes the construction of a row of modern apartment houses for operatives.

A new cotton mill, to be erected about three-quarters of a mile from the Canton Cotton Mills, on the Canton-Ball Ground state highway, is planned for Canton, Ga. An outlay of $2,000,000 will be expended, it is stated.

The capital stock of the Bibb Manufacturing Company, Macon, Ga., has been increased from $7,500,000 to $10,000,000 and application made for permission to increase it to $25,000,000.

Pittman Rubber Co., 218 Western Indemnity Bldg., Dallas, Texas, contemplate the establishment of a cotton mill to manufacture tire fabrics, as well as an automobile tire factory to consume the product of the fabric mill.

A new mill is planned for Columbus, Texas, M. H. Merrill, of Boston, is interested. A 10,000-spindle plant is planned.

Plans for a 10,000-spindle mill at Sugarland, Texas, have been prepared by the M. H. Merrill Co., of Boston, Mass., according to G. D. Ulrich, vice-president and general manager of the Sugarland Industries, Inc., which is interested.

Avondale Mills, Birmingham, Ala., will double the capacity of the Alexander City plant, it is announced, and will also erect fifty new cottages.

The New England Mill Situation.

There is again a touch of depression in the New England cotton mill situation following the prolonged dullness in the cloth markets. Eight Fall River corporations have entered upon a plan for curtailing production, and mills in other centers are gradually letting down as orders begin to expire.

Business in print cloth yarn goods has been very quiet for eight weeks and in that time less than a quarter of the output has been sold. The policy of selling only 60 days ahead worked well in the earlier months of the cotton year but of late, the little business that has been offered has gone to southern mills at lower prices than manufacturers in Fall River were willing to accept.

There are many mills there of course, that will run on throughout the summer, but the strictly print cloth yarn mills, making the more staple goods, must see a much wider profit margin than is now existing before they will sell with any freedom. Some of the mills began curtailing just as soon as the higher wage scales became effective, while others ran along for a couple of weeks before announcing plans for contracted schedules till further notice.

Outside of Fall River, some of the yarn mills, and some mills making narrow fine goods are allowing machinery to stand idle after orders run out. Renewals of business suggested by some buyers are far under any price mills will accept at this time. The fine goods mills have felt the effects of the late spring and the slow demand for fine wash fabrics. Converters have not been selling finished goods freely and have been unwilling to place supplementary orders for gray cloths. The shirting business has also fallen off, and some of the specialty orders are very small.

The large print works are still very busy although orders of late have been small. The bleacheries have been increasing their curtailment owing to the dull business in 4-4 goods. The job printers have not been accumulating orders of late but they still have many orders in hand. Some of the dyed goods plants are finding trade quieter and are beginning to slack up.

The actual percentage of curtailment thus far is trifling as the movement has been underway only about two weeks. But the very dull business this month is bringing many manufacturers close to the point where they believe they will conserve their assets by shutting down some machinery just as soon as orders expire. The course of the curtailment will depend entirely upon market conditions.

At the moment, May 17, it is the feeling in the trade that business will improve by June 1 and perhaps the shutting down will not be as general as now expected. But the buyers of the country seem to have their eyes fixed on the value of October cotton and when they talk of future contracts for cloth, they base their ideas of price on what October is bringing in the future market. Even with cotton at the spot price of 26.75c a pound, mills do not see a profit in goods on the basis of 9⅞c for 38½ inch 64 x 60s. Nevertheless, if there were orders in sight in volume sufficient to keep the product moving on some basis, the curtailment idea would not spread beyond individual plants.

Meetings of manufacturers have been held to talk over the situation but in nearly every instance it was decided to leave the matter of shutting down to individual initiative and necessities. While some reports have stated that a shortage of cotton is the cause of so much talk of curtailment, manufacturers who are in a position to know declare that if a profit margin between cotton and cloth existed, curtailment talk would cease quickly.

More than a majority of the mills are at work on goods for fall delivery and will not be affected by the necessity for curtailment before September, unless something happens to prevent buyers from taking in the goods on order. Nothing of that sort is in sight at the present time. The blanket and large napped goods mills are carrying the lightest unsold stocks in years. The gingham mills have not been receiving any repeat orders worth mentioning, recently, but they are so well sold that they are not likely to close. The wide sheeting mills are also well under order.

The fine combed yarn cloth mills have found business enough on fancies to keep them well employed. Their difficulty has arisen from the slow business on narrow goods and on many of the plain staple cloths such as lawns. It has been a novelty season on many cloths, and many of the printed designs have not sold in as large volume as expected. The weather has been so much against the wearing of sheer fabrics this spring, that converters have been unwilling to anticipate any repeat orders until they were actually in hand, covered by finished goods orders.

The fine combed yarn mills have also been working on a pretty close margin for some time and where they have not been working on specialty numbers their business has not been broad enough to make them look toward accumulating anything.

The advices from selling centers have indicated a strong hope of an early revival of cotton goods and cotton yarn demand. It has been the opinion that with the advent of warm weather and the receipt of much higher wages by many consumers, retail buying would become active and stimulate primary market trading. That hope was strong until this past week.

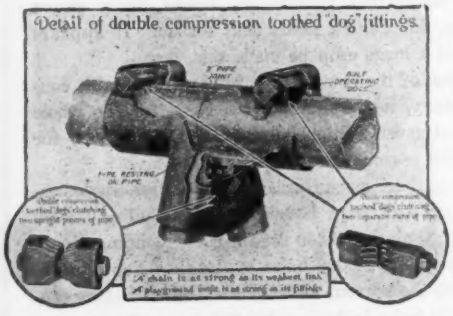
We never forget that the lives of Children depend upon how we build Everwear Playground Equipment.

Wherever there are Children—

Everwear All-Steel Playground Apparatus has a mission to perform. No interpreter is required. It immediately suggests its only function—PLAY—Clean, Character developing and Body building PLAY.

Children must play—
Give them a Safe Playground—

Phantomed Detail of Everwear Malleable, roller bearing Clamp. Frictionless, Care-free, Durable, Safe.



Each Patented Everwear Frame Fitting has 10 sq. in. of positive clamping surface for each pipe. No holes to drill nor set screws to worry about. Easy to erect; free from the necessity for continual attention.

DURABLE AND SAFE.

For this purpose it is specified and endorsed by leading Educators, Welfare workers, Playground Supervisors, Park Superintendents and Public Officials in America as well as numbering among its friends a steadily increasing number among all Nations.

Its many patented SAFETY FEATURES, the result of Everwear ingenuity and enterprise, alone constitute "Reasons Why" every Playground should be equipped with and standardized on Everwear Playground Apparatus.

For fifteen years, through the recognized channels for such activities, Everwear has been building the character and bodies of America's Youth. Today it ranks highest in every element making for Safety, Durability, Simplicity, Good Clean Looks, Play Possibilities and Low Ultimate Cost.

Thousands of Schools and Parks, and Hundreds of Public Service and Industrial Corporations are using "Everwear." They find it all and more than its makers promise.

"Everwear" will make permanent your playground investment.

Get acquainted with it. Send for 52-page illustrated Catalog.

The Everwear Manufacturing Co.

SPRINGFIELD, OHIO, U. S. A.

Please refer your inquiry to Department "R"

The new phases of the outlook are the action of capitalists and others in discouraging new building because of the excessive cost brought about by union demands and the rise in raw materials; the general slackening in demands for articles outside of the textile field; the widespread agitation against high sugar in women's clubs' and elsewhere; and the psychological effect of a beginning of curtailment in mill centers, and the talk of it in the newspapers. These things have all tended to make consumers more economical in their retail purchases than anyone looked for a month ago. The retail trade has been held back by weather, but many retailers now say that weather alone does not account for their slow trade.

Most merchants representing mills in this section are of the opinion that the depression will be very short lived. In fact several of them have stated publicly that they welcome the change in opinion that has checked rapid advances and now tends toward a more stable condition in prices and demand. They say it is all making for a very healthy trade that may take on very large proportions in the event of normal crop reports coming to hand in June and July.

Recent tabulations of dividends showed a more conservative attitude toward payments on the part of mill directors. There are very few extras now being announced and most mills are getting their reserves down to a basis where nothing better than regular dividends will be encouraged.

In sharp contrast with conditions in the South, there is little or no mill building going on here. While manufacturers are not as pessimistic in their talk as they were when the wage agitations were on a couple of months ago, and when legislation looking toward shorter hours was being fought, there is a distinct snugging up on the part of the large factors and a determination to adopt new measures for the reduction of costs and the amelioriation of difficulties with labor.

In Manchester, N. H., the Amoskeag management has succeeded in establishing relations with employees whereby mill problems in that city are to be discussed by managers and workers around a table and without the interference of unions dominated from New York or Washington. In Lawrence, there is a distinct effort being made to harmonize differences with woolen and cotton mill workers in plants like the American Woolen and the Pacific. In Fall River, a number of labor union secretaries, resident in the city, went to the South at the instigation of a local paper and made a personal investigation into the competitive conditions affecting them, as well as the mills.

These are only random instances of the rise of a new spirit on the part of the New England public and on the part of New England employers and employees. The president of the National Cotton Manufacturers Association has voiced the common spirit of New England in stating that the industry is not going to be moved South, and that stronger efforts are to be made to bring about better relations between mill owners and workers to the end that costs rather than wages may be attacked often.

The mills are still engaged in fighting considerable of the local taxation that has been imposed of late on mills and the court proceedings of some of these struggles indicate that a new light is being thrown on the dangers that lie in putting all public improvement costs on the chief industries of the textile cities. It is the adverse legislation, and the heavy taxation, that worry the competent mill men of the section, more than the advantages claimed by the new generation of southern mill builders. That New Englanders believe in southern mill progress is best shown by the rush of investment money there. But it is still debatable whether that progress means anything more than stimulation. It certainly does not mean early death for New England cotton mills.

Cotton Comment.

BY H. & B. BEER.

New Orleans, May 15th, 1923.

Until of late the cotton market during the past month remained depressed, having been in the process of liquidation, values having finally declined about three cents during the period and about six cents from the peak witnessed in the early part of March.

Meanwhile crop accounts were not at all satisfactory owing to too much rain and low temperatures in nearly all sections of the belt, and while warmer weather has prevailed recently, too much moisture continued to fall in the central and eastern portions of the belt.

Texas, however, the great cotton producing state of the cotton region, has had more favorable weather the past two weeks, permitting farm work and the new crop in that state to make fairly good progress.

Notwithstanding the general complaint of unfavorable climatic conditions in the South, there has been no improvement of consequence in the demand for spot cotton, which accounts for the inability of the market to respond to bullish weather conditions.

Even the continuance of heavy consumption by American mills failed to engender any stimulant in the situation, partly owing to the trade being under the impression that a large crop will be made this year; the indicated large acreage, the expected large increase in the use of fertilizer, and the belief that weevil will be less troublesome this year, being advanced as arguments to sustain such expectations.

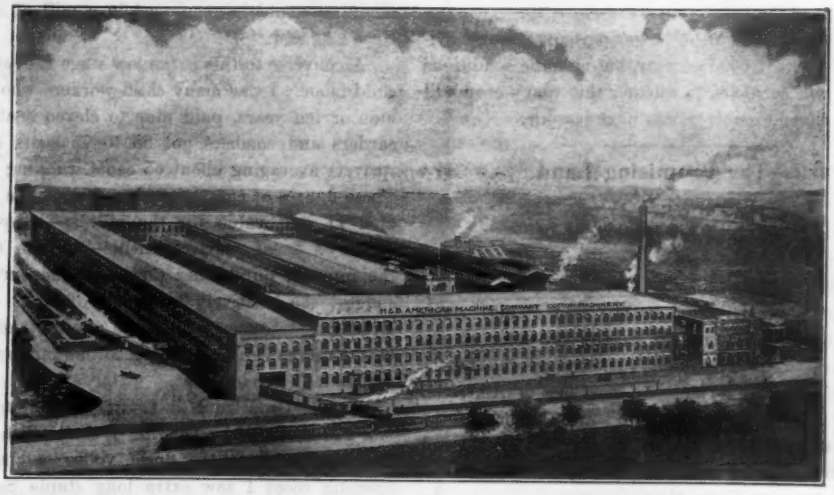
It is pointed out, however, that nothing less than a large crop, or say at least 13,000,000 bales, will suffice for next season's requirements without furnishing supplies to replenish depleted stocks; whereas an average crop, of say about 12,000,000 bales, which would be about 2,000,000 larger than last year's production, would likely prove inadequate for the world's needs next season. It appears imperative that a large crop be made this year.

Consumption of the raw product by American mills continues very heavy, now running on a basis for the whole season of about seven million bales vs. about 6,200,000 for the whole of last season.

According to the Census Bureau, consumption by domestic mills during April was 630,000 bales including 52,000 bales of linters, against 493,000 for the corresponding month last season, including 49,000 bales of linters. For the first nine months of the season, mills in the United States consumed 5,529,000 bales including 489,000 bales of linters vs. 4,917,000, including 470,000 bales of linters, for the corresponding period last season.

At the close of April American mills held a stock of 1, 889,000 bales compared with 1,461,000 last year, but stocks in public storage were only 1, 966,000 against 3,213,-

COTTON MACHINERY



WE BUILD

EXHAUST OPENERS—HOPPER BALE OPENERS—CRIGHTON OPENERS
BUCKLEY OPENERS—SELF FEEDING OPENERS
FEEDERS—COTTON CONVEYING SYSTEMS—ROVING WASTE OPENERS
INTERMEDIATE and FINISHER LAPPERS
REVOLVING FLAT CARDS—DRAWING FRAMES (Mechanical or Electric Stop Motion)
SLUBBING—INTERMEDIATE and ROVING FRAMES
SPINNING FRAMES and TWISTERS
(Band or Tape Driven)
SPINDLES—FLYERS—RINGS—FLUTED ROLLS

Descriptive Bulletins sent on Request

H. & B. AMERICAN MACHINE CO.

Pawtucket, R. I.

Southern Office: 814-816 Atlanta Trust Co. Bldg., Atlanta, Ga.

000 one year ago, total stocks reported amounting to 3,855,000 vs. 4,674,000.

That consumption on this side of the Atlantic will likely continue large is indicated by the fact that active spindles in the United States increased 15,273 last month, whereas during April of last year they decreased 543,147, the total at the end of April standing at the largest on record—35,515,791 vs. 31,389,695 last year.

While it is to be hoped that the South will be able to make a large crop this year for next season's requirements, the growing crop has yet to pass through the usual vicissitudes to be experienced during the growing and maturing periods of the plant.

As to the weevil, advices at hand tell of them showing up already in scattered localities of the western, central and eastern portions of the belt.

The acreage promises to be large, perhaps around 37,000,000 acres vs. 34,852,000 last year, but climatic conditions and the weevil will decide as to whether this year's crop will be sufficient for trade requirements next season.

Brazil—The Promising Land.

(*Continued from page 658.*)

and damp climate, plus richness of soil, affords excellent growing conditions.

In the more southern regions, like Sao Paulo, somewhat lower temperatures prevent raising the long staple, slower growing, often perennial, varieties of the northeasterly inland regions. The chief product is American Upland of an inch or slightly longer staple. Some of the yields in that state are remarkable, ranging up to 500 and even 800 pounds of lint per acre. Some fields in Brazil have grown cotton for 15 to 20 consecutive years. In the hotter northern regions are raised several longer staple varieties of exceptional character—the Serido, Moco, Riqueza, etc. The Serido yields run 25 per cent larger per acre than in Egypt, with the plants lasting as much as 15 years instead of annual replanting, and with much less need for cultivation or irrigation. In several districts of Brazil extensive irrigation works are now under way. (NOTE: SEE COTTON, JANUARY, 1923.)

In the great state of Sao Paulo the annual "American Upland" type rapidly reaches maturity, with only three months usually required from planting to picking and in some cases even this period is reported cut in half.

So far the Brazilian cotton crop has been practically absorbed by the native textile industry. The day is near, of course, when there will or should be a large exportable surplus for American and European mills. But also, with the large South American textile needs, there should be a considerable expansion of this Brazilian mill enterprise and a decided rise in its technical skill.

Today there are in Brazil about 250 cotton mills, with 350,000,000 milreis ($40,000,000 at today's value of the milreis) capital, an annual product of 450,000,000 milreis, about 1,650,000 spindles, 60,000 looms and 75,000 operatives. As in the raising, so also in the spinning, of cotton three of the 17 states lead.

In the immediate present the Brazilian mills are enjoying a considerable prosperity not only on account of textile conditions but because of the rate of exchange, which has enabled them to produce at a cost cheaper than the import price level on foreign goods, in addition to which has been the effect of relatively high Brazilian tariff duties on textiles. Thus the Brazilian mills are not only controlling the home market but exporting in considerable volume to other South American countries.

The American visitor to the average Brazilian mill is impressed with the large number of "hands." Cheap and relatively unskilled labor is the reason. Taking not one of the less but one of the more skillfully operated mills, I found that a plant with 72 cards, 32 combers, 40,000 spindles and about 1,000 looms, with a small dyeing and finishing plant—a combination frequent in Brazil, where there is less subdivision than in New England or Lancashire—had no fewer than 2,400 operatives, or about four times as many as would be employed in a mill of the same size in New England.

A converse to this is the low wage rate and the degree of child labor. I saw many child workers who looked not over nine or ten years, paid nine to eleven cents. Experienced carders and combers got 55 to 75 cents a day, with the weavers averaging about 65 cents, running two looms each These figures of course, are based upon the present depreciated 11 cent value for the milreis—a by-product of the country's fiscal embarrassments—and do not fully reflect the internal purchasing power of the currency; but they suggest the relatively low scale of wage standards. For Brazilian statesmen one of the questions of the future will be the choice between raising cotton for export or fostering textile mill development.

At the Cruzeiro Mill I saw yarns spun from No. 4 to No. 120 and fabrics ranging from turkish towels, suitings and osnaburgs to the finest voiles and muslins. In the opening room I saw extra long staple Sea Island cotton with at least 40 per cent seed and leaf waste and the fiber so irregular that you could pull a staple with a range of one-half of an inch.

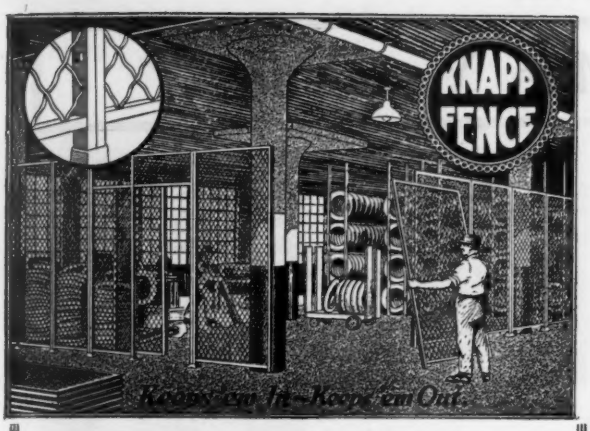
During my visit the machine shop had just finished assembling a complete spinning frame—homemade. Patterns were also being made to build looms and finishing machines.

With the assured growth of the country, and of all South America, the immediate market for the product should greatly increase, and an influx of foreign capital into textile enterprise would be a logical development. Under the exchange and tariff conditions prevailing, only the very finest cotton goods, not locally produced, can make their way into Brazil, which once was a considerable customer of Lancashire's.

Just as in the cultivation of the raw cotton, so also in the equipment and operation of its mills, Brazil must modernize its methods. A few of the mills are admirably designed and contain fine machinery, but the average is low; and there are many pieces of machinery anywhere from 30 to even 50 years old. The spindles are almost entirely of the ring variety. The percentage of waste is higher than needful—10 per cent to 15 per cent or even more.

Even under these handicaps the profits of Brazilian cotton mills average high. Dividends of 12 to 150 per cent have been common the past few years, and in recent months the average is understood to have been around 55 per cent.

(*Continued on page 672.*)



Erected Quickly Anywhere

For either permanent or temporary use, anywhere about a factory, warehouse or wherever a partition is required. Strong and rigid—yet easily moved when necessary. Keeps out meddlers, yet lets in light and air. Prevents loitering. Stock visible at all times yet amply protected.

You can save time and money by using

KNAPP STANDARD WIRE PARTITIONS

Made in standard units, including gravity doors, swing doors or wickets.

Some of the Many Uses

Tool cribs, factory subdivisions, stock rooms, department offices, shop restaurants, wash rooms, locker rooms, passage ways, etc.

Let Us Save You Money On
Window Guards, Factory Guards
Skylight Guards, Factory Gates, etc.

Send Sketch or Dimension for Prices.

THE KNAPP FENCE CO.
E. 134th St. Cleveland, Ohio

Attractive Opportunity for Live Sales Agents
Write for Particulars

NON-FLUID OIL

Less Stained Goods
Means Increased Production

AVOID the dripping and spattering of wasteful oil—use

TRADE MARK REGISTERED IN **NON-FLUID OIL** UNITED STATES PATENT OFFICE

Modern Textile Lubricants

Modern Textile Lubricants that won't drip, spatter or creep—but *stay* in bearings. Lasts much longer and costs much less for better lubrication than liquid oil.

NON-FLUID OIL is used regularly in most prominent cotton mills (over 70%) throughout the country—if you would like to test it for yourself—fill out coupon and mail for free sample.

New York & New ersey Lubricant Company

401 Broadway New York

Southern Agent:

L. W. Thomason, Charlotte, N. C.

Ample Stocks at Our Branches:

Charlotte, N. C.;

Greenville, S. C.;

Atlanta, Ga.;

New Orleans, La.

N. Y. & N. J. Lubricant Co.

Please send Testing Samples and Bulletin on "Lubrication of Textile Machinery" to

Name .....

Address .....

C-5-23

Better Lubrication At Less Cost Per Month

Notes About Men You Know.

JAMES F. MACENROE, has resigned as assistant treasurer and resident manager of the Ware Shoals Manufacturing Company, Ware Shoals, S. C., effective June 1. Mr. MacEnroe went to Ware Shoals in 1905 and was made assistant treasurer and resident manager in 1909. Prior to moving to Ware Shoals, Mr. MacEnroe was connected with the Riegel Paper Mills, at Riegelsville, N. J., and also with the Riegel Sack Company, of Jersey City, N. J. Mr. MacEnroe announces that he will take a month's vacation following the termination of his connection at Ware Shoals.

J. CAPERS GAMBRILL has been appointed assistant treasurer and resident manager of the Ware Shoals Manufacturing Company. He has been superintendent of the dairy, department store, and other enterprises at Ware Shoals for several years.

G. C. CAUBLE, who has been overseer of carding at the No. 4 and No. 5 Mills of the Efird Manufacturing Co., Albemarle, N. C., has become associated with the Dixie Spinning Mills, Chattanooga, Tenn., in a similar capacity.

W. E. BEATTIE, recently elected president of the American Cotton Manufacturers' Association, has resigned as president of the Victor Monaghan Company, Greenville, S. C., and as president of the Piedmont Manufacturing Company, at Piedmont, S. C. His resignation at the Victor Monaghan Company is to be effective June 30, and T. M. Marchant, vice-president, has been elected to succeed him as president, and retains his position as treasurer.

HERBERT LINDSEY was made vice-president in addition to the office of secretary-assistant treasurer, and A. H. Cottingham is general manager and W. A. Floyd assistant treasurer.

S. MARSHALL BEATTIE, son of W. E. Beattie, has succeeded his father as president of the Piedmont Manufacturing Co. W. C. Cleveland, of Greenville, is vice-president and treasurer. W. E. Beattie retains an interest in both corporations, but his resignations were prompted by a desire to retire from active business life.

A. CULBERSON, recently connected with the Camperdown Mills, of Greenville, S. C., has been made general manager of the Texas Cotton Mills, McKinney, Texas, and the Dallas Textile Mills Co., of Dallas, Texas, of which J. Perry Burrus is president. Mr. Culberson was formerly superintendent of The Dixie Cotton Mills, La Grange, Ga., and after that was associated with the Hunter Manufacturing and Commission Company, leaving this connection to go with the Camperdown Mills.

FRED J. YOUNG, general manager of the Bemis Brothers Mills, Bemis, Tennessee, with his overseer of spinning, Douglas Ballard, visited mills in Georgia and South Carolina recently.

MARTIN STANFIELD has been appointed overseer of carding at the Elk Cotton Mills, Dalton, Georgia.

W. H. TISDALE has accepted the position of overseer of carding at the Adams Cotton Mills, Macon, Georgia.

EDWARD B. SMITH, of Pawtucket, R. I., who has represented the Whitinsville Spinning Ring Company, Whitinsville, Mass., in that section for the past nine years, died recently. Mr. Smith was widely known in the South. He was 62 years of age, and a 32nd degree Mason.

R. W. JENNINGS, superintendent of the Lanett Cotton Mills, West Point, Ga., and general chairman of the Textile Operating Executives of Georgia, was recently elected president of the West Point Rotary Club.

J. S. BAKER, who has been connected with the Providence office of B. B. & R. Knight, Inc., has become associated with the southern offices of the H. & B. American Machine Company, with headquarters at Atlanta, Georgia.

H. D. AGNEW, formerly of Demopolis, Ala., has become general manager of the LaFayette (Ala.) Cotton Mills. George W. Layfield, formerly at Pritchard, Ala., is overseer of spinning, and C. H. Goodroe, is superintendent.

J. W. ALLEN, formerly of the Mobile Cotton Mill, Mobile, Ala., is overseer of spinning at the Alexander City (Ala.) plant of the Avondale Mills.

R. F. SMITH has become day overseer of carding at the Standard Cotton Mill, Cedartown, Ga. Mr. Smith was formerly overseer of carding at the Hillside Cotton Mill, La Grange, Georgia.

THEODORE FIELDS, formerly card grinder at the Exposition Cotton Mills, Atlanta, Georgia, is now night overseer of carding at the Standard Cotton Mills, Cedartown, Ga.

W. A. HUNT has succeeded his father, J. T. Hunt, as overseer of carding at the La Grange (Ga.) Mills.

J. W. BOWERS, formerly of Enterprise, Ala., is now overseer of carding and spinning at the Yazoo Yarn Mills, Yazoo City, Miss.

W. M. MELTON has been promoted from the twister room to overseer of spinning at the Cleghorn Mills, Rutherfordton, N. C., it is reported.

A. G. PITTMAN has resigned his position with the Shaw Cotton Mills, Weldon, N. C., to become night overseer of carding at the Pomona Mills, Greensboro, N. C.

J. W. HILLARD has become overseer of dyeing at the Lola Manufacturing Company, Stanley, N. C.

HORACE S. SEARS, a member of the firm of Wellington, Sears & Company, and treasurer of the West Point Manufacturing Company, West Point, Ga., died at his home in Weston, Mass., on Saturday, April 21. In addition to being treasurer of the West Point Manufacturing Company, Mr. Sears was treasurer of the Anchor Duck Mills, at Rome, Ga., and the Chattahoochee Valley Railway Company, and a director of the Columbus Manufacturing Company, The Dixie Cotton Mills, Equinox Mill, Gluck Mills, Lanett Bleachery & Dye Works, Samoset Cotton Mills, and the Sherman Manufacturing Company.

JOSEPH M. JACKSON has been elected treasurer of the West Point Manufacturing Company, succeeding the late Mr. Sears, and Mr. Jackson was also elected treasurer of the Chattahoochee Valley Railroad, and the Anchor Duck Mills of Rome, Georgia. Mr. Jackson has been treasurer of The Dixie Cotton Mills and the Equinox Mills for several years.

THOMAS W. HARVEY has gone to the Banning Cotton Mills, Banning, Georgia, as night superintendent.

WILLIAM PARKER, president of the Standard Cotton Mills, Cedartown, Ga., died recently in Lothersdale, Yorkshire, England, where he had gone on a visit.

FROM the wringing out of a single pair of sheer hose in a twelve-inch laboratory or sample type, to the drying of a 700-pound paper makers' felt in a 72-inch machine—TOLHURST Extractors are equally effective. There is a type and style of TOLHURST for every extraction requirement.

Catalog on request

TOLHURST MACHINE WORKS

Established 1852

Troy, N. Y.

New York Office—111 Broadway

TOLHURST
REG. U.S. PAT. OFFICE
EXTRACTORS
TOLHURST MACHINE WORKS ESTABLISHED 1852. TROY, N.Y.

Western Representative:
JOHN S. GAGE
8 So. Dearborn St.,
Chicago, Ill.

Southern Representative:
FRED H. WHITE
Realty Bldg.,
Charlotte, N. C.

San Francisco Representative:
B. M. PILHASHY
Merchants Exchange Bldg.
San Francisco, Cal.

Canadian Representative:
W. J. WESTAWAY CO.
Westaway Bldg., Hamilton, Ont.
400 McGill Bldg., Montreal, P. Q.

W. A. KENNEDY, sales engineer for textile machinery and supplies, has established offices at 14½ South Church Street, Charlotte, N. C., his former address being 1000 South Boulevard, Charlotte. Mr. Kennedy represents the Electro Bleaching Gas Co., of New York, manufacturers of "Liquid Chlorine;" The Root Company, Bristol, Conn., manufacturers of counters; and the Fletcher Works, Philadelphia, (formerly Schaum & Uhlinger), manufacturers of extractors. Mr. Kennedy also does special work for other concerns in handling machinery and equipment on special assignments such as new dyehouses and bleacheries, etc.

MARTIN P. GLYNN, secretary of Cannon Mills, Inc., died suddenly on May 12 at his home at Bala, Pa. Mr. Glynn was one of the best known men in yarn circles, and had been connected with the Cannon Mills organization for fifteen years. He was manager of the yarn department of Cannon Mills. He was 50 years of age.

HENRY WOODLAND, secretary-treasurer of the Allis-Chalmers Manufacturing Company, died suddenly at his home in Milwaukee on Monday, May 14. Mr. Woodland became assistant treasurer of the company in 1901 and was later made its treasurer. In 1916 he was elected secre-'ary-treasurer. At the time of his death he was also vice-president and a director of the Hanna Engineering Company of Chicago.

Brazil—The Promising Land.

(*Continued from page 668.*)

In the Federal state of Rio the 48-hour week is legalized, while in the interior the mills operate up to 70 hours weekly.

Given such profitable returns on invested capital and such prospects in the way of cotton supply, costs and markets, there is bound to be an active future in the matter of expanding and improving the mechanical equipment of the mills. And here there apparently exists a notable opportunity for New England enterprise and commerce.

Hitherto the Brazilian industry has almost wholly depended upon England for mill machinery and supplies, with a little buying from Switzerland. I saw but a few hundred dollars' worth of American machinery in the mills I visited. Brazil has apparently been an unknown land to the makers of American textile machinery. Yet there is every reason for, and practically none against, the winning of this lucrative trade opportunity by the mill machinery concerns of New England.

It will require, of course, some reasonably earnest and intelligent attention to cultivating the possibilities of this great latent market. It will be essential, for example, for such houses to send down their own representatives, well instructed and equipped in the ways of doing business in Brazil, instead of entrusting the whole matter to native commission houses—a procedure seldom productive or profitable. It will mean keeping in close and continuous touch with conditions and prospects in Brazil. But the effort will not be difficult; and as a few very recent tentative inquiries have proved, it will be richly rewarded.

It does not require an economic seer to forecast a great mutual flow of trade between Brazil and New England, comprising raw cotton bound in this direction and a wide variety of mill equipment bound south. Already the shipping facilities exist in abundance, and under the stimulus of such trade, expansion would unquestionably be greatly increased. Four vessels a month are now plying between Brazilian ports and Boston, three regular lines and one tramp, with every prospect of increased service by the International Freighting Corporation which operates steamers of the United States Shipping Board. In most cases a portion of the cargo is discharged here and the balance at the terminal port, i. e., New York. Boston is by a considerable margin the nearest major Atlantic port to Rio.

The geographical situation is symbolic of the general commercial situation between ourselves and Brazil. Before and during and since the war it has been universally recognized that Brazilian-American affiliations were close and cordial; and it would be the most natural and logical development for trade ties also to become numerous and intimate.

Toward England there is a noticeable lack of such cordiality of feeling in Brazil. The preference, both in sentiment and in actual tariff rates, is for the United States. In fact, the tariff preference recently given the United States by Brazil averaging 20 per cent has slightly strained diplomatic relations between England and Brazil.

Primarily Brazil must remain and grow rich as an agricultural country. Besides its former staples, coffee and rubber, it offers magnificent opportunities in the raising of cattle. An official of one of the largest banks in Rio offered me 1,280,000 acres, divided by a navigable river, with more than 10,000 wild cattle and three tribes of Indians thrown in, for 11 cents an acre. Only a few miles from the coast the daily wage averaging last fall only a mileris a day, or about 11 cents.

Such conditions are symptomatic of a virgin country, financially somewhat deranged, but before which wait tremendous opportunities when systematic and intelligent development of its resources arrives. And the greatest destiny of Brazil, both because of its own natural gifts and the needs of the world, is in cotton. Agriculture must be developed first; then industry and trade. And there is no world neighbor, whether we look at geography or trade currents or mutual needs, that is or should be so close to Brazil as New England.

Summer School at Georgia Tech.

Mill men interested in the summer school for mill teachers and others, to be conducted at the Georgia School of Technology from June 25th to August 4th, may secure complete information by applying to Professor C. B. Seal, director, The A. French Textile School, Georgia School of Technology, Atlanta, Ga.

As outlined on page 462 of the April issue of COTTON, one primary purpose of this school will be to give to the teachers and other workers in the mill villages a fundamental knowledge of the different departments in the mill, and intensive courses in the various operations of textile manufacture will be held. There is often a lack of appreciation on the part of the mill school teacher of the dignity and possibilities of cotton mill work, and it is to demonstrate these to the people who have in their charge the educating of the children in the mill villages that the school is to be held. Other subjects will be taught by a capable faculty, and college credit will be given those who have completed college entrance requirements.

INTANGIBLES IN MANUFACTURING

A Series by

Frederick H. McDonald

Considering Profits

Is the Product A Help or A Hindrance?

A large portion of the time, we hear about some particular product that has a wide demand, or somebody convinces us that his idea is a good one—and we soak our money in the manufacture of something that we have a deuce of a time selling, even at a loss.

To insure a profit there must be a real reason for the manufacture of any particular product.

This reason is the existence of a present or a creatable demand for it.

It must meet some kind of a need or desire which people are willing to pay to have satisfied.

If this fundamental fact is taken care of, half the problem is solved.

Then the size and kind of possible market for this article must be investigated.

Is the demand universal, national, sectional or local? Is it seasonal, requiring a rush of production with large storage, or is it steady the year around? Is it a luxury with a restricted field and the maximum demand small, so that the market may already be oversupplied? Or is it a basic necessity with the demand unlimited?

If the demand is large, how do you expect to compete with the others that most likely are already supplying it? Can you produce more cheaply, or will you produce a better article? Profit lies in either course—the market is glutted with just-as-goods at the same price.

Will changing styles throw your product quickly out of date?

Is there danger of loss through the discovery of a better product?

Will there be any salvage in the shape of waste or other usable by-products? Can you use them yourself, or sell them profitably?

In other words, the desire to make a certain thing, plus even a well equipped plant to make it, can be a liability unless you know where to sell it, how much you can get for it, and how much of it you can sell.

It will pay to investigate your market—first.

U S BOBBIN & SHUTTLE Co.

LARGEST BOBBIN and SHUTTLE MANUFACTURERS in the WORLD

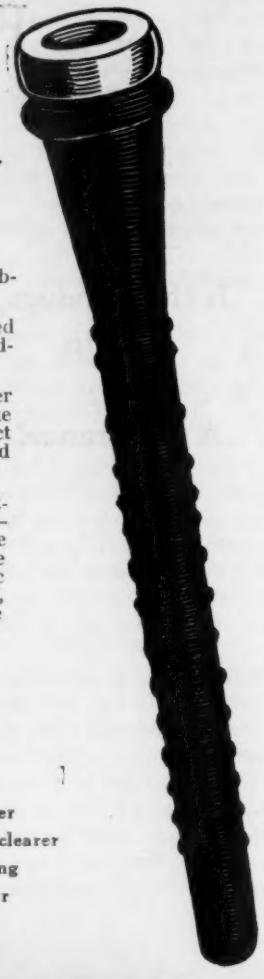
Eight Factories — Providence R.I.

One Name—

Eight Big Plants

One Standard of Quality

Scores of Products



The best known name in the world, when it comes to bobbins, shuttles and other textile products.

Eight big plants, with facilities and resources unequalled in size and completeness for the production of quality products at more reasonable prices.

One standard of excellence is maintained, for every member of the big USB&S Co. army of long experienced workmen take pride in their work in order that every USB&S Co. product live up to the reputation of quality and service established many years ago.

Scores of products, every one perfect in design and workmanship—US Bobbins, strong, light, smooth and true—"Stetson" Hand Threading Shuttles, the best exponent of the hand threading shuttle known—the new "S Eye" Shuttle, the most perfect automatic shuttle ever put on any automatic loom, and noted for its simplicity, ease in positive threading, uniform tension, etc.—Every USB&S Co. product has some outstanding feature which makes it the best of its kind.

A sample of any US product will be sent gladly on request. Catalog?

U S B & S Co. PRODUCTS

BEAMS
- Cotton
- Rubber

BOBBINS

SHUTTLES

SKEWERS

SPOOLS
- Moquette
- Drawing
- Warper
- Twister
- Jack
- Silk
- Belting

SPEEDERS

WARP FILLING

CAP FILLING

FLAX SPINNING

TWISTERS

TRIPTODS

QUILLS

ROLLS
- Comber
- Underclearer
- Drawing
- Winder

ETC.

AN OLD TIMER SAYS

Tall trees from little acorns grow. Yes, very true, but most of the young men of today don't want to take the trouble to plant the acorn.

If overseers could realize that ten inches of first drawing sliver makes over ten miles of yarn, they would be more careful to teach drawing hands to put up ends properly.

An employee first learns to respect, then to honor, and finally to love the overseer or superintendent who is strict, but just and kind and has no favorites.

If you are absolutely square with your employees, you can *make* them be square with you.

Most any overseer or superintendent can run a job when everything goes smoothly, plenty of help, high wages, supplies to burn, etc. But just let the tables turn and then you will have a chance to see who are the *good* men.

So many young men can't seem to get it into their noble heads that promotion almost invariably comes to the man who *deserves* it, who has worked for it. They all want it all right, but when it comes to going down after the *work* to get it, that is not so funny. Too many of us confuse ambition with a desire to have things handed to us on a silver platter.

A lot of men have to work like the dickens to try to overcome the mistakes they have made. Mistakes are valuable to any man as experience, provided he profits by them. The way to do that is not to make the same mistake twice.

The man who flies into a rage and cusses everybody out when something goes wrong will soon discover that he has got to fly into a rage every time he wants something done or his men won't know whether he really means what he is saying or not.

When the first weavers in South Carolina were put on eight looms, I heard that the overseer at a nearby mill made the remark that the overseer who had just given his weavers eight looms would soon be out of a job.

Well, here is the way it finally turned out: the overseer who had progressiveness enough to branch out from the old rut and put his weavers on eight looms is today general superintendent of one of the finest plants in the South. He is located not fifty miles from where he was overseer when he put the weavers on eight looms. The last time I heard of the other overseer, he was in Greenville, S. C., running a little stand on the corner of a street in one of the mill villages, selling peanuts, candy, etc. He never did rise to a superintendent's position, and finally lost his job as overseer.

This is not fiction, but actual facts. I worked for the man who is now general superintendent, and the other man was a distant relation of mine.

Just why some men can't see an inch beyond their noses I can't understand. They are ready to pull back every time their employer tries to start a new idea or wants to try out a new scheme. At any rate, I have given you an example of what actually happens to most men who are built that way, so draw your own conclusions and remember, "Old Timer" has warned you.

The really efficient overseer or superintendent is he who makes his important decisions before time to put them into effect. It is certainly a good plan to think over any change you intend to make before you act too quickly. If possible, wait until tomorrow or next week, providing it is something that is going to affect all of your operatives.

Try your best to look at the change from the other fellow's standpoint. What is he going to think about it; is he going to catch your idea? If you are close enough in touch with the people under you—that is where experience comes in—then you will have no trouble in putting into effect most any new plan which will be better for all concerned.

For example, very few mills have been able to successfully pay for spinning by the hank.

Well, now, whose fault is it?

Of course there are overseers and superintendents who get results even if they do lose their temper. But—

The sun gets results without indulging in explosions. It produces results by the exercise of its great drawing power. The most successful overseer or superintendent is a drawer, not a driver.

When the constitution was being drawn, one man jumped up on the floor and objected, because "many citizens will be more than 300 miles from the seat of this government."

Foolish, wasn't he?

Well, how about the overseer of today who objects to every progressive idea the superintendent trys to put across?

"Tom, Dick and Harry"

Calling attention to a too general lack of appreciation of Relative Values in Cost Accounting

Tom, Dick and Harry are never permitted to make requisitions on bank accounts. Yet, too often, are they allowed to requisition stores, or, at times, just to take and use materials as they see fit.

The one or two percent cash discount on materials purchased is never lost sight of. Equal concern is seldom given to the fact that a physical count of the inventory shows a shrinkage of one to three percent.

In nine cases out of ten the inventory is the largest of all the current assets.

The value of materials on hand is usually much greater than the cash in bank. Yet many concerns estimate their profits on a Cost System which permits of a shrinkage factor in inventory.

Accurate and persistent control of inventory on hand and unfilled commitments, is the safeguard against shrinkage or loss. It is just as important as accurate and persistent control of the bank account. It is simply a matter of recognizing *relative values*—adopting a Cost System which is based on *relative values*.

ERNST & ERNST

AUDITS—SYSTEMS—TAX SERVICE

NEW YORK
PHILADELPHIA
BOSTON
PROVIDENCE
WASHINGTON

CHICAGO
MINNEAPOLIS
ST. PAUL
ST. LOUIS
KANSAS CITY

CLEVELAND
BUFFALO
PITTSBURGH
DETROIT
CINCINNATI
MILWAUKEE

INDIANAPOLIS
TOLEDO
ATLANTA
RICHMOND
BALTIMORE

NEW ORLEANS
DALLAS
FORT WORTH
HOUSTON
DENVER

No "bad cloth" when you weave with "DUPLEX" FLAT STEEL LOOM HARNESS

STEEL HEDDLE MFG. CO.

GREENVILLE PHILADELPHIA PROVIDENCE

Southern Office

509 Masonic Temple **Greenville, S. C.**

Hampton Smith, Southern Manager

N. B.—We are the sole Manufacturers of Nickel-Plated drop wires for every kind of loom.

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

The Angle of Yarns.

EDITOR COTTON:

If I had used the title, "The Twist of Yarns," it would probably have been more readily recognized by the readers of COTTON. But it is not the twist that I want to bring to the reader's especial attention. It is the angle that I want to emphasize most. We have often heard people talking about the twist of yarns. But the important and fundamental question, the angle of the yarns, has been neglected for some reason or another. Although this is not a direct answer to any of the questions asked in the March issue, on twists of rovings and yarns, it is the writer's belief that this may at least throw some new light upon the subject.

"Why do we use the square root and a twist multiplier in figuring the twist of yarns?" This was the first question I asked myself when I first became interested in spinning yarns. I am sure that there are others who have asked the same question. I tried to find an answer to this in many books written on the subject of spinning, but I failed to discover any satisfactory solution of the problem. Finally I met an authority on cotton spinning, and he told me that it is because the angle of yarns is constant. Basing my calculation on this statement, I have worked out the following solution, with the aid of a little mathematics. I would like to present it to the readers of COTTON for their criticism and discussion.

Before we get into the discussion of the angle of yarns, I want to make clear that there are two preliminary assumptions—first, it is assumed that all the diameters of yarns are diameters of perfect circles; and secondly, the density of the yarns using the same multiplier is assumed to be the same. Now at this point, another factor has to be introduced, and that is the diameter of yarns. It is simple enough to show exactly why we have to use the square root instead of the number itself, and what the square root stands for by the aid of the following formulae:

Take any two numbers of yarn, say 1s and 2s. In view of the fact that the 1s yarn is just twice as heavy as the 2s yarn, of the same length, and the density of the two yarns is the same, the area of the cross section of the 1s yarn must be twice as large as that of the 2s yarn.

Then letting A_1 represent the area of the cross section of the 1s yarn, and A_2 represent the area of the cross section of the 2s yarn, we have

$$A_1 = 2A_2$$

We can represent them by the general formula of the area of a circle

$$\frac{\pi D^2}{4}$$

where D stands for the diameter of the circle. Then

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

$$A_1 = \frac{\pi D_1^2}{4} \text{ and } A_2 = \frac{\pi D_2^2}{4}$$

where D_1 stands for the diameter of 1s yarn and D_2 stands for the diameter of 2s yarn.

By substituting the first formula, we get

$$D_1^2 = 2D_2^2 \text{ or, } \frac{D_1^2}{D_2^2} = \frac{2}{1}$$

Therefore, $D_1 : D_2 :: \sqrt{2} : 1$.

Putting this in words: the square root of the number of the yarn is the ratio between the diameter of number 1s yarn and that of the number in question.

Now, we can see that the square root means something more to us than merely the square root of a number. The next logical thing for me to do should be to give a discussion of the actual measurement of the diameter of yarns before we pass on to the most interesting subject, the angle of yarns. But the diameter of yarns is such an interesting subject itself that it deserves a thorough discussion. And I am afraid that we have no space to spare at the present

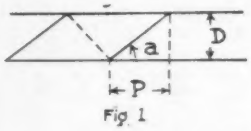


Fig. 1

time. But anyone who is interested in the subject may find interesting reading in a paper entitled "Diameter of Yarns," by Samuel Wakefield. So for the time being we will take the one given in "The Textile Manufacturer's Year Book," as our standard, which comes very near to the writer's observation.

Now we are all ready for the discussion of our most interesting subject, the angle of yarns. Most of us are not accustomed to think of the angle of the yarn. But we are rather familiar with screw threads. So I will take the ordinary screw thread for illustration. Referring to Figure 1 and remembering the statement that the angle of the yarn is constant, let us see what angle we get when we use 4.75

Safety For Stored Coal

All-Galvanized
ANCHOR POST FENCE
will unfailingly protect that coal supply of yours. It's strong, unclimbable, impregnable.

Made of heavy chain link mesh—No. 6 wire. Suported on heavy steel U section posts that have no hidden, unprotected surfaces where moisture can collect and rust form. **Drive-Anchorage** permanently maintains fence alignment, defying soil disturbances due to repeating frosts and thaws.

Every part **galvanized throughout** by the thorough, old-fashioned hot-dip-spelter method.

The nearest Anchor Post office or sales agent will gladly give you complete information on just the fence you need. Phone, write, or wire.

ANCHOR POST IRON WORKS

52 Church Street, New York, N. Y.

Boston, Mass. 79 Milk Street
Chicago, Illinois 8 So. Dearborn Street
Cincinnati, Ohio 141 East Fourth Street
Cleveland, Ohio Guardian Building
Detroit, Mich. Penobscot Bldg.
Hartford, Conn. 902 Main Street
Mineola, L. I., N. Y. 167 Jericho Turnpike
Philadelphia, Pa. Real Estate Trust Bldg.
Pittsburgh, Pa. 541 Wood Street
Rochester, N. Y. 48 Berry Street

Sales Agents in Other Cities 2474-G

FIRM—BECAUSE THEY ARE ANCHORED

Anchor Post Fences

PERMANENT—BECAUSE THEY ARE GALVANIZED

as our twist multiplier. In the illustration, D represents the diameter of the yarn, which for 1s yarn is 1/16.1 inches; P is $1/(2 \times T.\ P.\ I.)$ $T.\ P.\ I.$ being twist per inch; and "a" is the angle of the yarn in question.

We can easily picture this in our mind's eye as an ordinary screw. Then D would be the diameter of the screw and P would be half the pitch. Then,

$$Tan.\ a = \frac{D}{P}$$

In the case of 1s yarn, $D = \frac{1}{26.1}$ *inches.*

$$T.\ P.\ I. = \sqrt{1} \times 4.75 = 4.75$$

$$\text{Therefore, } P = \frac{1}{2 \times 4.75} \text{ inches.}$$

$$Tan.\ a = \frac{\frac{1}{26.1}}{\frac{1}{2 \times 4.75}} = \frac{2 \times 4.75}{26.1}$$

Therefore, Angle $a = Tan^{-1}$ .36398 or 20° approximately.

Now let us take 4s for example; 4s is taken here for simplicity only. In fact any other number can be taken at random:

$$D = \sqrt{4} \times 1/26.1 \text{ inches}$$

$$T.\ P.\ I. = \sqrt{4} \times 4.75$$

$$P = \frac{\sqrt{4}}{2 \times 4.75} \text{ inches}$$

$$Tan\ a = \frac{\frac{2}{26.1}}{\frac{2}{2 \times 4.75}} = \frac{2 \times 2 \times 4.75}{2 \times 26.1}$$

And the Angle "a" still remains to be 20°.

So we see clearly by this time that why we have to use a twist multiplier and why the square root has to be used instead of the number itself. And the angle is constant.

After all, this is only the theory of it. In actual practice it is almost impossible to get the same diameter of yarns exactly as we want it to be, as there are so many factors that will affect both the density and the diameters. But in the writer's belief this is not far from the truth.

In order to give the readers some idea of the range of angles of different yarns, using the different multipliers that we are using at present, I will do another example, using the other extreme, say by using 2 as the multiplier.

Taking 1s yarn also this time, we get

$$T.\ P.\ I. = \sqrt{1} \times 2$$

$$P = \frac{1}{2 \times 2}$$

$$Tan\ a = \frac{2 \times 2}{26.1}$$

Therefore, Angle $a = Tan^{-1}$ .15325 or 8° 43′ approximately.

We can also see that by changing the twist multiplier we are not only changing the twist per inch but also changing the angle of the yarn as well. Another fact that we learned from this study is that we are now having the angle of the yarn between 8° 43′ and 20° approximately when we are using twist multipliers of from 2 to 4.75.

Incidentally, this twist study helps to explain the fact why the English warp yarn breaks at a lower number of pounds than the American; because they are using a smaller twist multiplier (usually 3.75 for warp) than American practice, which is generally as high as 4.75.

I really do not know to whom we should be thankful for the twist multipliers we are now using and the original thought of using the square root and a twist multiplier. I shall greatly appreciate any of the readers of COTTON telling us some more about it. H. H. Y. (Mass.)

Card Chains and Gear Speeds.

EDITOR COTTON:

Replying to "W. G. M." in the May number as to whether or not it is good practice to put on new chains when putting on new flats, will say it all depends on how much the chains are worn. Try one set by taking out one or more flats, and if the flats don't bag down and rub the front plate, it will indicate that more service can be gotten from the old chains. But if after taking all the slack out or after getting the flats as tight as is advisable to run, and then they still rub the front plate, it is time to get new chains or a special sprocket which some of the shops furnish. If there is much space between the flats it is best to have new chains as a lot of fly will be blown out.

As to the diameter of the gear governing the speed, there is nothing to it, as the speed is governed by the number of teeth regardless of the diameter. But all gear blanks should be the correct diameter or the teeth will be too thin, if too small, or too thick if too large. The way to find the diameter of a blank to give the desired number of teeth when the pitch is known is to add two teeth to the number of the gear desired and divide by the pitch, which will equal the diameter of the blank. Example: Number of teeth desired, 50. Pitch, 10.

$50 + 2 = 52$

$52 \div 10 = 10.2$ inches or 52/10 diameter.

U. D. (Ala.)

EDITOR COTTON:

"W. G. M. (Ala.)," in the May issue, asks the question, "Is it a good policy to buy new chains when putting on newly covered card flats?" It possibly might be a good policy, but it is a question whether yon can have them bought. My policy always has been to take a link out of them when they become slack and would bag at the back of the cards, and also when putting in newly covered flats, if they needed it. When my flats first begin to wear so they bag, I take out one flat, and then later on often have to take out another. It is a common practice to do this, and I do

EDWARD A. STUHRMAN

Mem. Am. Soc. C. E.
Mem. Am. Concrete Institute.

Candler Annex, Atlanta, Ga.

General Structural Engineering
In
Steel and Reinforced Concrete

Industrial Plant Layouts.

Warehouse—Factories—Commercial Buildings.

Accurate Preliminary Estimates of Cost.

Appraisals. Reports.

not find but one real objection. The flats get open and you will have more fly over the cards by using old chains too long. This can be overcome to some extent by adjusting the drafts on the cards.

But just because I do this I don't say it is best, but it is sometimes hard to get the mill management to buy new chains when other mills are taking out links. I have never tried to figure out what possible loss there is in this fly over the cylinders, but don't think it is very much, because the fibers are short and I suspect they would fly out at other places if they didn't come out here.

In regard to his gearing question, there is a certain diameter for a certain number of teeth, using a certain pitch, and when you get out of that line you are experimenting with odds against you and with absolutely nothing to gain, for gears were never intended to run that way. For to be exact you must have the gear blank exactly the true diameter, for the pitch and number of teeth desired. You might get some to run that way, but it's against its nature.

Contributor No. 14.

EDITOR COTTON:

I will endeavor to answer in this letter the questions asked by "W. G. M. (Ala.) in the May issue, giving what I believe to be a solution of his troubles.

In the matter of buying new card chains for newly clothed card flats, I will say that this is not entirely necessary. If one wishes to spend the money for this, then of course there would be no need to go into any further detail, but if one does not wish to do this, then there are ways to get around it.

Most cards have a take-up on one of the stands for tension on the chain, but providing that this has been pushed out to the limit, the chain may be shortened. This of course would necessitate the removing of one flat, which "W. G. M., would not want to do, probably.

I was on the road for a machine company about five years ago and was sent to a mill to look over a section of cards, in regard to whether it was expedient to take out the link or replace with new chains, the take-up stand being out to its full length. We did not do either, but replaced the flat sprocket pulley with a larger one and a stand to match. In this way we were able to use the total number of 110 flats without removing any flats.

In regard to the two gears of the same size diameter, but having a difference of two teeth—if one holds strictly to theory, and the correctly figured method, then this would be wrong, but it is practicable on fine pitch, slow moving gears. The diameter of a gear is in direct proportion to the number of teeth on it, and any variation in the number of teeth therefore will increase or decrease the diameter accordingly. Where a gear is driving an idler swing or one where an appreciable amount of play can be had, then by pulling the cutter out the right distance the extra two teeth can be cut on the same diameter. Also by cutting a thinner tooth the extra two teeth can be added. I have seen this done so I know it to be so. On a fast moving gear one would have trouble, for the pitch is not a true one, and is liable not to run even with clearance, and on large tooth gears would be almost impossible. Following is the correct figured method for finding the diameter: Rule—Add 2 to the number of teeth and divide by the pitch, this gives the diameter. Thus: 10 teeth plus 2 equals 12, divide by 6 (pitch) gives 2 inches diameter. Increase the 10 teeth to 12 and add 2 and divide by 6, and the diameter is 2⅓ inches. It goes without saying that a larger gear driving a smaller one causes it to turn at a greater speed.

Regardless of the number of teeth to be found in gears, they must have the same pitch or they cannot be made to run together in mesh, and there is no need to look any further than in one's own room to find this out. I will say to "W. G. M." that the next time he sees the two men who were arguing, that he give them the following to work on, and I am sure that at least one of them will find figures are better than mere words. Example: Given driving shaft making 21 r. p. m., exactly 48 inches from a driven shaft making 35 r. p. m. To find the number of teeth of driving and driven gear, also the circular and diametrical pitch of each, to be used on each shaft. I am sure "W. G. M." will find it interesting to find a mechanic to work this out for him, if unable to do so for himself. K. (O.)

Uneven Laps.

EDITOR COTTON:

The discussion of even laps has once more come to the surface and I hope it will not be lost sight of again for some time to come.

The picker is the foundation upon which the quality of all yarn is built, and it is of the utmost importance to see that all parts work as nearly perfect as possible. "K. C." in a recent article pointed to one of the greatest drawbacks to even work, and that is the way the cotton is delivered to the carder, sometimes the cotton is dried out and at other times it is direct from the bale. Since the war this evil seems to be on the increase due to the fact that a good many mills ran close to the wall financially and instead of making a mix of from 25 to 50 or 75 bales they will give the carder 4, 8 or 10 bales at a time, just enough to keep his machines going, which does not allow for any semblance of a mix at all.

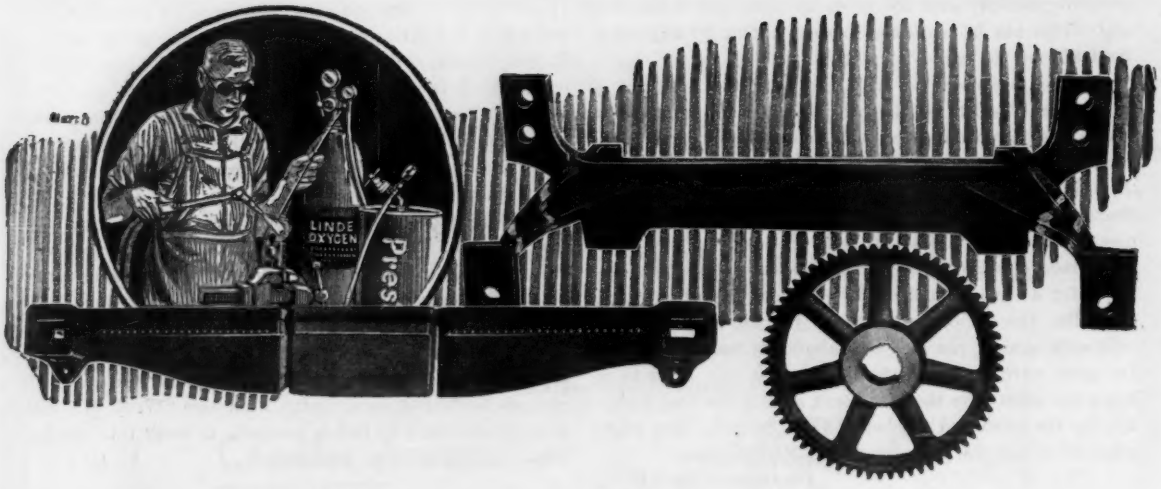
This in itself is enough to put numbers all over the lot.

Another fault is with the bale breaker.

In several instances I have seen the top pin cylinder running at too low a speed allowing the cotton to go through in lumps; this forms a very poor breaker lap and throws too much work on the evener of the finisher picker. By speeding up this roll the cotton is opened better and allows the hopper to be fed heavier; this will compensate for the loss which would seem to be inevitable by the speeding up of the pin cylinder.

In the October 1921 issue of COTTON there was an article by "J. H. Y. (Ga.)" entitled "A Thin Lap Preventer for Breaker Pickers." The sketch illustrates an evener that has been standard equipment on certain makes of machines for a good number of years. This can be improved considerably by adding a long apron to be worked automatically by the swing door. The sides should be built up to about 24 inches high and the cotton kept to the height is fed automatically to the hopper, thereby helping to eliminate the drawback of the human element with which we have to contend so much.

The apron A, Fig. 1, is driven from the bottom of the upright spiked apron by the pulley C to a fast and loose



Don't buy new parts— Oxweld the old ones

The oxy-acetylene process of welding and cutting metals continues to open up whole new fields of economic possibilities in the textile industry.

Its wonderful savings have caused many mills to install it as an essential part of plant maintenance equipment.

Think of the number of times you are subjected to vexatious delays through the breaking of small metal parts, and the sums you are obliged to tie-up in stock for replacements. Calculate the costliness, even then, of substitution and repair.

Oxweld, on the other hand, is saving great sums by quick, *permanent* repairs. Oxweld equipment welds or cuts all metals—brass, copper, steel—especially cast iron! Our users are saving time, and carrying fewer replacement parts.

Textile men have assured us that an Oxweld outfit pays for its installation in from three to six months.

Oxweld Resident Engineers in over fifty cities are ready to help on your problems—to point out the many economy short-cuts this process makes possible.

OXWELD ACETYLENE COMPANY
Newark, N. J. Chicago San Francisco

Oxweld

WELDING AND CUTTING APPARATUS

World's Largest Manufacturers of Welding and Cutting Equipment

pulley on the first shaft of the apron A at D. The intermittent motion of A is governed by the amount of cotton in the hopper E. As the amount of cotton in E decreases the plate or door B swings nearer to the spiked apron. At the same time a suitable arrangement of levers operated by the weight lever F throws the belt onto the fast pulley at D, thereby operating the apron A. This insures a steady feed of cotton to the hopper E, thus helping to eliminate the uneven breaker. lap and relieve the evener of a load it was never intended to carry.

The finisher picker, on which so much depends, is one of the most neglected machines in the mill. I was called upon by a friend of mine a short time ago to look over his

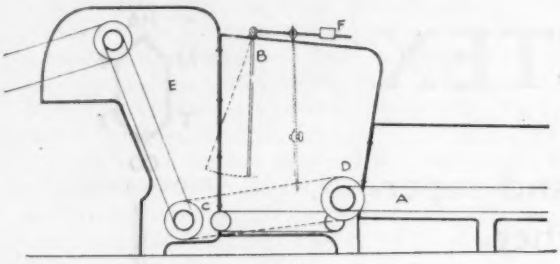


FIG 1

pickers; they were not working satisfactorily. Upon investigation I found his idea of scouring was to take down his fronts, but *never* to touch the pedals of the regulator or evener.

The whole of his regulators were rusted, the pins were worn and the regulators as a whole were sadly in need of repair while the rest of the machine was in good condition. Because the evener is more or less enclosed it is neglected and still expected to turn out good work. The pedals should be taken from the evener about every six weeks and thoroughly polished on the bearing surface with a coat of graphite. All knife edges should be kept in good condition and polished in the same way. Never use oil here as oil gums up, collects dirt of all kinds and puts the evener out of commission. Use a good rubberized cone belt, keep the evener clean and it will more than repay for the time spent.

I have been a reader of COTTON for about nine years and during that time I have reaped a good harvest of information from the "How Other Men Manage" department, and I think if those pages in that department were put in convenient book form they would be a mine of information that it would be impossible to get in any other way, and would be a welcome addition to the cotton mill man's book shelf. I would like to hear what some of the boys think about it.

K. E. V. (R. I.)

The Hockaday Company, with southern office at Newberry, S. C., of which O. H. Johnson is manager, has just issued an interesting booklet entitled "Solving Your Painting Problems." This publication is devoted entirely to the use of Hockaday paints in southern textile mills, and a very attractive outlay of photographs of typical mills where these paints have been used include some of the more prominent plants in the South.

Some New Devices.

EDITOR COTTON:

In the December number of COTTON, "K. S. (N. C.)" asked me to quit bringing up little things that are not pleasing simply because the stuff I write or some of the stuff I write is too deep.

And now in the April issue, "Competition (N. C.)" says, "Let's ask him (meaning me) to get away from this antique stuff and let us have some of his honest-to-goodness progressive causes and results."

In my article commented upon by "Competition" I gave some practical suggestions. If "Competition" will look up the January issue of COTTON and turn to page 183 he will find that Robert Huskey writes this same "antique stuff."

You may call "Wash" an "old timer", but his advice is always sought on some new devices or inventions. At the present time we have on the market a device that can be attached to any ring frame, that will make a much longer bobbin and a stronger yarn, at least that is what is claimed. In attaching this device, the thread guide board is removed. Then auxiliary rings are mounted on the ring rail about three inches above the ring; this, of course, is to eliminate whipping. There is an opening in the auxiliary ring through which the yarn is passed before it is put over the auxiliary roll and pieced to the drawing rolls.

Next, the auxiliary roll is mounted and grooved over every spindle which takes the place of the guide wires. This roll is set so that the point of delivery positions the end over the radius of the spindle, as does the guide wire.

The auxiliary roll runs in the opposite direction to that of the front drawing rolls, also at a slightly higher speed. The idea is that it causes the twist in the yarn to run to the biting point of the drawing roll.

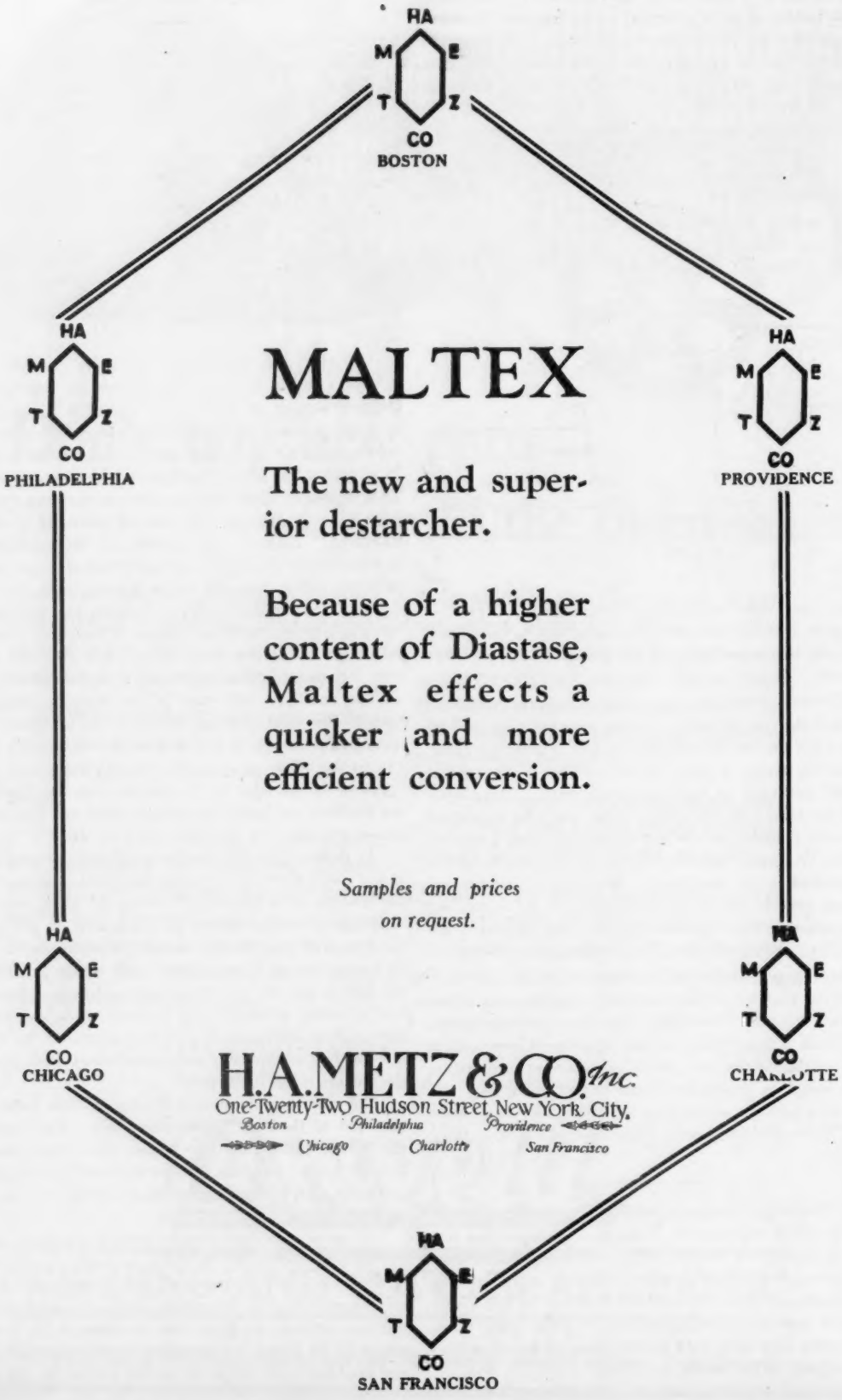
It is claimed also by the makers that the functions of the auxiliary roll make the yarn stronger, and that the weak places are saved.

At doffing time the auxiliary roll can be pushed back to the roller beam, so as to give the usual clearance to doff the bobbins as in the case of raising the guide wire board.

There is another device on the market in the form of the Bramwell feed which is attachable to any card. It may be a surprise to "Competition" and others to know that the time is not far off when there will be no picking system in coarse mills spinning numbers no lighter than 28s yarn. This device is now being tried out by "Wash" and to date has proven very satisfactory and does what the makers claim for it.

The raw stock is passed through a bale breaker and next fed to the feed box automatically. The stock from the lifting apron falls into a pan that weighs the exact amount fed, at intervals. When the pan is empty, it rises and locks, and remains locked until unlocked by the weight of stock in the pan.

As stated, this has already proven a success, and by not beating the stock, the yarn is much stronger. This should convince "Competition" that there is going to be much competition in the cotton manufacturing industry in the near future. So, from what he states in the last paragraph of his letter, the foregoing improvements and modern machinery of which he speaks makes the future for


HA
M E
T Z
CO
BOSTON
HA
M E
T Z
CO
PHILADELPHIA
HA
M E
T Z
CO
PROVIDENCE
MALTEX
The new and superior destarcher.
Because of a higher content of Diastase, Maltex effects a quicker and more efficient conversion.
Samples and prices on request.
HA
M E
T Z
CO
CHICAGO
HA
M E
T Z
CO
CHARLOTTE
H.A.METZ & CO. Inc.
One-Twenty-Two Hudson Street, New York City.
Boston Philadelphia Providence
Chicago Charlotte San Francisco
HA
M E
T Z
CO
SAN FRANCISCO

him very dark indeed. The only remedy is to keep on reading COTTON.

"Competition" states also in his last paragraph: "I knew a fellow working on a five-roller process, eight into one delivery drawing frame to eliminate one more process. Will it make good?"

My answer is it depends on the amount of draft. If the draft is not over six inches, I think it will prove successful. However, I see no benefit in five lines of drawing rolls, unless to make the draft excessive.

Stock drawn through twenty lines of rolls, if the draft is excessive, receives the same severe treatment as drawn through four lines of rolls. That is why a light sliver from the card makes a better roving and yarn. You may have three processes of drawing, second intermediates, etc., which of course makes the draft more gradual, and removes the frictional contact between the front steel and top leather rolls, for the reason that the top leather rolls have less drawing to do. The point I wish to convey is that it is the same with the number of machines as that of rolls; if you make say a 60-grain card sliver and 50s yarn, it must be drawn so many inches and the longer the draft, the more the fibers are disarranged in the cross section of the strand, which means heavy and thin places. See the point?

I anticipate preparing further descriptions on the devices mentioned as soon as I have completed the tests. At this writing I feel sure that the card attachment mentioned will eliminate the present picking system in mills running numbers no finer than 28s. However, as regards the attachment on the ring frame, I have my doubts.

Wash (R. I.)

Why One Man Lost His Job.

EDITOR COTTON:

Not so very long ago a friend of mine, a boss carder, was fired. I am going to tell why he was fired and why his successor made good.

The scene was a certain fine goods mill of about 70,000 spindles. The carder in question had been with the company for some years. He was first a fixer on speeders, then second hand and finally overseer, at which he worked for about five years.

Everyone has heard of men thinking that they were married to their jobs—that is, they felt sure of them. Well, this overseer was certain his job was on ice, so to speak. He began to find time to read the morning newspapers. It was only a short time afterward when things began to happen—first vague reports of uneven work were heard; the beamers were having trouble moving their chains, so were the quillers; and the spoolers were working like Trojans trying to make half of their normal pay. Even the speeder tenders were beginning to grumble—they were continually stopping to piece up ends.

The superintendent traced the bad work back and pinned it onto Mr. Carder, who immediately sent for his second hands, gave them what your Chinese correspondent calls two LLs and ended up by saying, "if you don't cut out this uneven work, somebody's going to be fired." Little did he think it might be himself!

Things got worse, if anything, they surely got no better, but the boss always had plenty of time to read his morning papers—he was doing so when the storm broke.

Never in my life did I ever see such a surprised man—he could hardly comprehend the situation, so unexpectedly, as he thought, had the axe fallen.

The new carder was a young man—as the old timers would say—one of the new school, for he was a textile school graduate, and a hard working practical man besides. He knew his job but he had no time to read the newspapers.

Here is how he went about his job: The picker room first received his attention. He went over the room from A to Z; he cut down beats per inch here, and perhaps raised them there. The fan speeds were gone over and the draft gears looked over to see that they were all the same in each process. This done he next had each picker overhauled, from evener motion to calender rolls. Then he weighed the laps and tested them for length, he found differences which he corrected. He cut the allowance of variation per lap from one-and-a-half pounds each way to a half-a-pound each way. The picker room boss was ordered to weigh the intermediate laps twice each day, so they would be very near what they ought to be as to weight per yard.

Next, the cards received his attention, he inspected them thoroughly and found great variations from standard in some of the settings, careless grinding had been the cause. He gave orders to have them all re-set and ground. The emery clothing on the grinder wheels attracted his attention—the clothing was worn smooth. He ordered new clothing to be put on all grinders at least every two weeks because he knew that smooth emery only polishes, that it does not cut or sharpen. Too much cotton was being lost through the card strips, so he had the percentage plate setting made closer. Then he weighed the sliver and wherever he found too great a variation from standard he had it rectified. He took card tests to determine what percentage of waste each card was making and then had those that were off, corrected.

The doublers and ribbon lap machines were all found to have different draft gears where the third hand had changed them because one machine or another seemed light or heavy to him. Right there the overseer issued an order and had it posted that no one had authority to change any draft, twist or doffer gears of any description without permission from him—under penalty of being fired on the spot.

Here was this man's reasoning: "Take the doublers for instance. They were made by the same concern at about the same time, they were all running on the same grade of cotton, so why should not all do the same work if all had the same draft gears on them? So when a draft gear was changed after that on one frame, because the work was coming light or heavy, then all the frames were changed together."

The combers were badly in need of an overhauling, both re-setting and re-gauging. He found that about half of the stop motions were not working properly and the drawing rolls needed re-setting and the top rolls revarnishing or re-covering. Too many tenders depend entirely on the flag to tell whether their combers are running or not and since most tenders are only interested in the number of hanks they turn out, they never bother to see how the work is running so long as the flag tells them that they are making hanks, so this man ordered all of the flags disconnected

Takes the Hard Work out of Figures

THE *hard work* in Figures is the constant striving for accuracy—the uncertainty of results.

The Monroe Automatic eliminates all the hard work—gives the *proven answer* when the tip of your finger says—"Go".

To add or multiply, touch the Plus (+) Bar; to subtract or divide, touch the Minus (—) Bar. The responsiveness of these touch bars, coupled with the high speed of the mechanism, makes the Monroe Automatic a machine that is always ready for the operator's next move.

From its very beginning, the Monroe has kept pace with the demands of business and today stands apart as an instrument of complete figure service. The Monroe handles simply and directly any form of figure-work, with split-second speed yet guarantees accuracy of results.

We invite you to judge for yourself the merits of the Figure Service offered by the Monroe line of figuring machines—the Automatic Models, the Standard Models, Fraction Models, etc. A trial demonstration puts you under no obligation. Simply address:

These little Touch Bars set the machine to work. Simply touch the Minus (—) Bar for Subtraction and Automatic Division; the Plus (+) Bar for Addition and Multiplication.

MONROE

REG. TRADE MARK.

Calculating Machine Company

WOOLWORTH BUILDING, NEW YORK

Adds
Multiplies
Subtracts
Divides

Monroe Service is available at all Principal Points in the U. S. and Canada and throughout the World

—the tenders grumbled a little, but they soon got over it and the work came very much better.

The drawing frames did not stop as quickly as they should, the top rolls needed re-varnishing and the trumpets needed replacing with some with a smaller hole in them, for the old ones did not properly condense the sliver. Needless to say the new overseer stayed right with the frames until they were running to his satisfaction.

All of the speeders had to be gone over, from slubber to jack. The first thing he did was to put a gang on scouring and greasing them while the fixers went over them under his personal supervision and straightened them out. Hardly two frames had like gears on them, some ran light and some ran heavy. He also gave orders to have the creels changed over from running out half a frame at a time to one full row at a time. His reason being that where half a frame at a time ran out the new roving put up might have been made in the rain while the half already in the creel might have been made on a sunny day—thus one end of the frame would run heavy and the other light. Now when one full row ran out at a time the whole length of the frame got the same work in the creel as for instance, the middle row might be heavy while the bottom row might be light, according to climatic conditions, while the top row just put in might be either—but regardless of that the whole frame would be turning out the same work. If, for any reason, after his job got running as it should, the work got light or heavy consistently, say for two or three days, then he would change the gears on all of his jacks a tooth or two this way or that, the same theory applying to the speeders as to the ribbon lap machines and doublers.

It is needless to say, the new man can't find time to read the newspapers on the job, because if he doesn't do his work he can't expect his help to do theirs.

Gen (Mass.)

Turning Spinning Rings.

EDITOR COTTON:

I have read with interest the report of the spinners' meeting at Spartanburg in the May issue of COTTON, particularly that part of the discussion referring to the turning over of spinning rings.

There are two factors which must be given careful consideration in endeavoring to have good spinning, in addition to the necessity for a good roving. The first is the condition of the rolls, including the settings, and the second is the proper traveler. To make an end run good, or to make a side of ends run good, the travelers must be very carefully balanced, and to have that condition the rings must all be as nearly the same as it is mechanically possible to have them, both in roundness and smoothness.

When spinning rings are reversed, or turned over, there will be found a large number of them that are pitted from rust. These pit marks can never be taken out. Consequently, when a whole side of rings are turned over, even though they are balanced, there will be some smooth and possibly as good as new, but a large percentage will never be smooth. Consequently, the traveler running on the smooth ring will have a great deal less tension on the yarn that the traveler running on the rough, pitted ring, while if the rings could all be the same, in either condition, the travelers could be balanced. But it is a difficult, well nigh impossible, thing to make a set of spinning run good where some ends pull hard and some pull light.

A. G. (S. C.)

Balanced Twist.

EDITOR COTTON:

"M. L." has certainly asked a very interesting question in the March issue of COTTON, regarding balanced twist.

So far the writer has failed to come across a satisfactory definition for the term "balanced twist," though it generally implies that the ply yarn will not kink when the twist in the single yarn and that in the ply yarn are properly selected. Even this statement is very indefinite and sometimes misleading, as to determine whether the ply yarn will kink or not depends upon so many factors, such as the nature of the fiber, the moisture content of the fiber, and also the nature of the twist, whether hard or soft, etc. So we see that twist alone cannot determine whether the finished yarn will kink or not, although it undoubtedly plays an important part in the matter. It probably would be wise for us to go into the matter in detail as suggested by "M. L." and draw our conclusions from our discussion.

The best way to analyze the question of twist is from the angle of yarn viewpoint and the reader is also referred to a letter on that subject by the writer which appears in this issue, for a more thorough discussion. It might be of interest to note that Professor A. F. Barker of Leeds University has arrived at the same answer, though he used an entirely different method from that used by the writer. And what is more, Professor Barker has actually provided a table of angles to determine the hardness of twist. But unfortunately the table refers mostly to worsted and not to cotton; that makes it hard for us to use it in our present discussion.

In twisting two single yarns together to form a two-fold yarn, Professor Barker tells us that four conditions are possible. These are: first, that the folding twist does not balance the single twist; second, that the folding twist exactly balances the single twist (converse twist); third, that the folding twist brings the fibers longitudinally in the thread (straight fiber twist); and fourth, that the folding twist more than balances the single twist, fiber angle and twist angle being in the same direction (concurrent twist).

The writer would rather call it three conditions, since the second named condition is but a special case of the first named. With the question of kink in view, the third condition shall naturally be chosen as the ideal condition. We can all easily see that anything laying straight will have the least tendency to kink. The formula for this third condition is

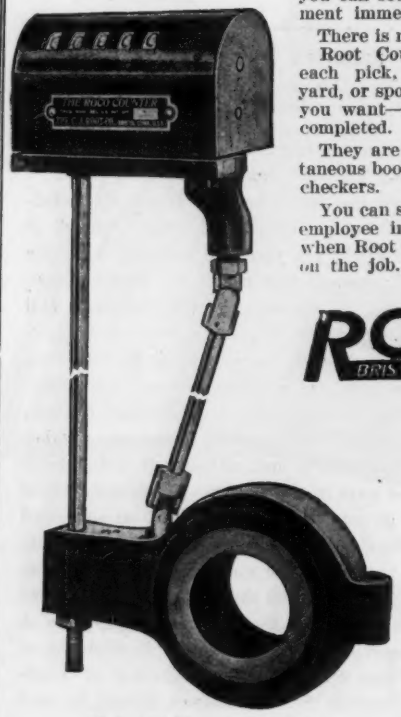
$$\frac{t}{\sqrt{2}} = T$$

in which "t" equals turns per inch in single yarn and "T" equals the turns per inch in the ply yarn.

Now let us apply this formula to "M. L.'s" example:

$\sqrt{36} \times 3.75 = 22.5$ turns per inch (single)

$\frac{22.5}{\sqrt{2}} = 15.9$ turns per inch (two-fold)



With Root Counters on your textile machines you can settle the argument immediately.

There is no come-back. Root Counters count each pick, hank, foot, yard, or spool—anything you want—just as it is completed.

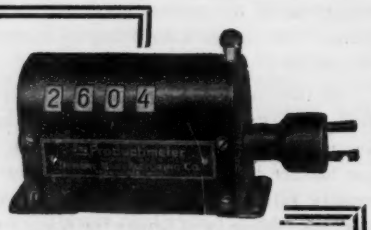
They are your instantaneous bookkeepers and checkers.

You can settle with an employee immediately—when Root Counters are on the job.

ROOT
BRISTOL, CONN.

Ask us "How it is done"
We will gladly tell you

It's the Picks That Count--



The Productimeter

Counts the Picks

No matter whether you operate at slow or fast loom speed, you should know definitely what the loom and operator are really producing. You can't profitably nor rightfully figure costs on guesswork. The important question is: Are you getting the picks you are paying for? Check your figures against the record of The Productimeter and be sure you are right.

Inefficient, careless operatives and wasteful, time-killing looms will be counted out. You will get definite data on which to determine your costs. You will find the leaks, if there are any, and can stop them.

Ask us about the Productimeter in the Textile Mill

DURANT Manufacturing Company
633 Buffum St., Milwaukee, Wis.

(1096)

Warren Soaps

Preferred Stock

The best quality tallow, palm, and red oils and olive foots, carefully balanced with the purest chemicals for your special purpose.

Uniformity guaranteed by test before shipment.

Warren Soap *Warren Service*

Warren Soap Mfg. Co.

Established 1870
77 Summer St. Boston, Mass.
Incorporated 1890

while, $\sqrt{18} \times 5.5 = 23.3$ turns per inch (two-fold)

From the foregoing we can easily see that "M. L.'s" case falls into the fourth class. But I would not say whether it will kink or not, as I have mentioned before that this cannot be determined unless the other factors are known. However, "M. L." can readily find it out for himself by making an actual test at his mill; and for that matter anyone can do it if he so desires.

I hope that the readers of your discussion department may be able to suggest a satisfactory definition from the foregoing discussion. H. H. Y. (Mass.)

What Causes this Waste Trouble?

EDITOR COTTON:

I should like to have the following subject discussed under "How Other Men Manage."

Quite recently while conversing with an overseer of spinning, the matter of waste collecting on the outer edge of the clearers and thus hanging down over the front roll was brought to my attention. This was a trouble that had recently arisen in his department, as well as in the carding, although at first he had thought the difficulty to be in his department only. One realizes that clearer waste should accumulate between the first and second rolls and between the second and third rolls, and thus be readily picked off by the spinner. These clearers were picked four times a day but the trouble of accumulating and hanging down over the front roll, which is a newly arisen trouble, still persists, and so far a remedy for it has not been found. I therefore investigated in another mill and found that in the carding department the waste hung down over the front roll on the speeders, but this trouble did not arise in the spinning. As one may well realize, there is a possibility of an end on a roving frame gathering some of this clearer waste as the end vibrates, causing a lump in the roving.

I should, therefore, appreciate it if you would have this matter discussed by COTTON'S readers, suggesting as to what may be the causes and possible remedies. Both mills referred to run stock of approximately 1 inch staple. I should also be interested to know whether such conditions prevail in mills running longer staples. Bert (R. I.)

That Clearer Waste Trouble.

EDITOR COTTON:

I will give "Bert (R. I.)" some dots from my experience with regard to his clearer waste trouble.

The only time we ever had anything like the condition he describes was when we were using a patent roller varnish, or as some call it, roller dope. Then this clearer waste hung down over the front roller. Upon investigation I find on some of the machines in the card room it hangs down now, while some are all right. We find on the frames where it hangs over the front roller that the top clearer is too heavy, that is, the clearer cloth presses down on the front roller too heavy, and will not let it go under the clearer as it should. Some claim the humidity conditions could cause this trouble. We are not having any trouble like "Bert's" now, using 1 3/16 to 1¼ inch cotton. Some of the men around our plant like the short wool cloth in preference to the long kind, but I like the long kind best in the spinning. A (Ala.)

EDITOR COTTON:

In reply to "Bert (R. I.)", as to the cause of lint gathering on front of the top clearers on spinning and hanging down over the thread. I have had a great deal of this same trouble and have given it exhaustive study, and while I believe I can point out the cause, I have not found a remedy, or at least a remedy that the spinner can apply.

A low grade of cotton is the principal cause. That is, cotton with an excessive amount of short fibers. That is, of course, the cause of nearly all fly waste. If all the fibers were of the same length and the same strength, the fly-waste at every process would be almost *nil*. Hence the obvious moral—the more short fibers the more fly-waste.

"Bert" verifies this conclusion when he says he found the same trouble on the speeders. If he will investigate he will find that the carder has had to run a heavier lap to produce the same counts of yarn since this trouble developed, or has had to "heavy up" somewhere else along the line.

As to why the accumulation is on the front of the top clearer, if anyone will take a look he will find just as much waste accumulation between the first and second and third rolls as formerly; perhaps more. A microscopic examination will show the fibers of the accumulated waste back of the front roll to be very much shorter than those that gather on the clearer in front of the roll; this would indicate that the latter accumulation of waste fibers did not break away from the stock back until drafted between the first and second roll, and then followed through the rolls to be gathered up at the first point of contact with the top clearer. The shorter, dust-like fibers going under the clearer and accumulating between the rolls on the clearer.

The fact that the cotton is classed as 1 or 1 1/16 inch has nothing to do with it. It is the excessive amount of fibers that are too short, which causes the trouble.

In regard to "Bert's" mill which had this trouble in the carding and not in the spinning. I dare say there was a difference in the way the top clearers fitted on the spinning in the two mills. If the top clearer does not fit down snug against the leather roll, the accumulation will not occur in front, but further back under the clearer. It may also be due to the kind of rolls used or the condition of the rolls. If one will notice there will be a much greater accumulation on a new roll than on an old roll due to the new leather being slick and free from oil, and the fly or short fibers will adhere to the clearers at the first touch of the clearers, while on the old leather roll the fibers will adhere tighter, and be rubbed off with more friction further under the clearer.

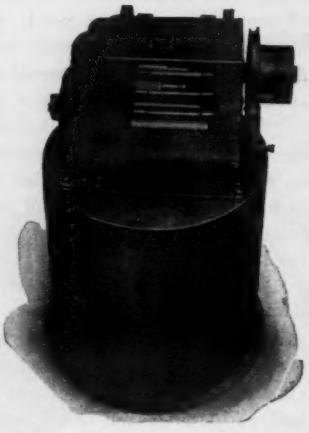
There isn't a thing "Bert" can do unless he gets better cotton. A. G. (S. C.)

Safe Practices Phamplet No. 54 entitled "Handling Material" has just been published by the National Safety Council, 168 North Michigan Ave., Chicago. It is divided into five main divisions—power trucks, hand trucks, piling material, handling by hand and safe habits of work.

A Coupon That May Cut Your Operating Cost

Learn the Facts About Cheaper Cleaning of Roving Bobbins

If in your mill roving bobbins are cleaned by hand, we can give you information that will certainly be of interest to you and very probably will be of value to you.



If you have not already carefully investigated the saving effected by cleaning roving bobbins with a Termaco machine, fill out the attached coupon and mail it to our Engineering Department.

Merely as an indication of the lowered operating cost effected by the Termaco is the fact it cleans, with only a single operator, 36,000 roving bobbins a day, and cleans each bobbin more thoroughly than hand cleaning and without cutting or splintering.

We can give you other figures regarding Termaco installations that perhaps will surprise you.

It does not obligate you in any way to send us the coupon. We are anxious to send you complete information regarding the Termaco and what it will accomplish for your mill.

Drop the coupon in the next outgoing mail.

TERMACO

Every machine trademarked TERMACO is sold under a binding guarantee as to workmanship, material and operation.

THE TERRELL MACHINE COMPANY, INC.
Engineering Department, Charlotte, N. C.
(General Supply Co., Danielson, Conn., Representative for N. Y. & N. E.)
Without obligating me in any way, send me complete particulars regarding the Termaco and the savings it effects.

Name .....

Mill .....

Address .....

—Yet Creo-pine Costs No More

Creo-Pine sub-flooring has established a new standard in creosoted wood sub-flooring.

Every piece of Creo-pine sub-flooring is made of Southern Yellow Pine, free from defects, and is dressed uniform in size. Every individual section of Creo-pine sub-flooring receives careful inspection after every operation; every piece is seasoned exactly like every other piece; and all are subjected to exactly the same treatment of creosote oil by the Vacuum Pressure Process. The result is a sub-floor that gives added satisfaction with each year's use.

—yet Creo-pine costs no more than ordinary creosoted sub-flooring. In the long run, it actually costs less.

Have you written for descriptive literature?

Creo-pine Sub-Flooring

BLOCK FLOORS
CONDUITS
CROSS TIES
CROSS ARMS
TELEPHONE POLES
FENCE POSTS
BRIDGE TIMBERS

Southern Wood Preserving Co., ATLANTA, GA.

A New Differential Device.

EDITOR COTTON:

In the March issue of COTTON appeared an article entitled "The Houldsworth Differential". To my mind the writer of that article has much to learn about the subject. First, the Houldsworth motion is not a differential; it is a compound. Second, a differential is one that retards the bell gear when the differential sleeve is stopped.

True, as he says, Aza Arnold did invent the planet motion. But after he secured the rights of his invention he was at a loss to what it should be applied. One story is that he intended using it in a boat or canoe to obtain variable speed. However, to Henry Houldsworth belongs the credit of connecting the spindle and bobbin during winding.

In the year 1823, Mr. Green was at work on, and had succeeded in making a bobbin of roving by the employment of a pair of cones having straight outlines and the variable speeds obtained with such an uneven rack. But all Mr. Green's labor was in vain when Mr. Houldsworth connected the bobbins and spindles with the employment of Mr. Arnold's invention.

In the February issue of COTTON I promised "K. S." I would prove my idea regarding fly frames by the drawings of a truly cone-driven frame. In the April issue I said that I would "write an article with a sketch of a new device (patent now pending) that removes all strain from the cone belt, and holds conditions equal on all fly frames. I know it will be welcomed by mill men. It is truly a cone-driven frame."

The following remarks, describing this device, are not an advertisement, for I have the promise of one shop building fly frames to try it out as soon as possible. Before describing this new device, however, I will briefly outline the amount of work the cone belt and bottom cone must do during the building of a set of roving.

First, on all the new differential motions exists additional compounded speed or additional impetus caused from the cone. In other words, we have a high speeded bottom cone.

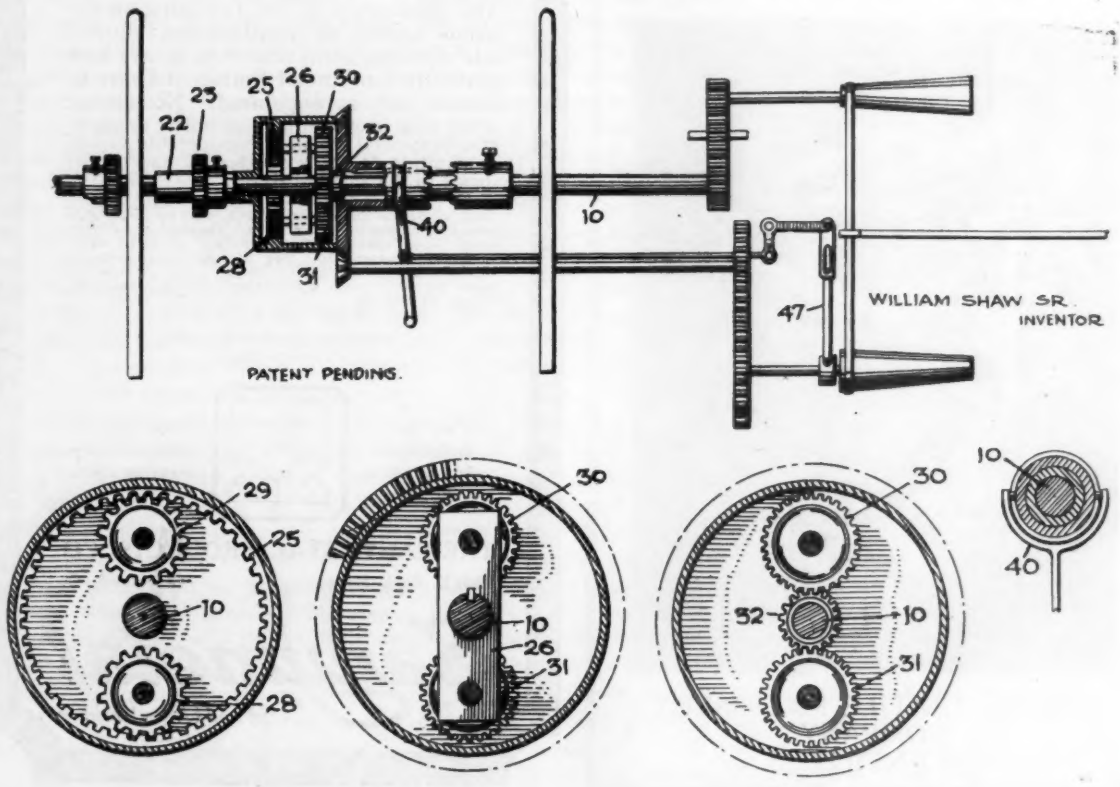
Second, on all fly frames, at the beginning of every set of roving, the cone belt is on the large end of the top cone, and on the small end of the bottom cone. Again, on all fly frames, the bottom cone is run at its maximum speed at the beginning of each set.

Third, the cone drives the carriage. Therefore, a dry lifting shaft, a tight spindle, a dry bobbin gear, bolsters out of plumb, dirty gears, etc., will increase the slippage of the cone belt. The pressure of the paddles on the bobbins is nearly sufficient to keep the spindles up to speed after the frame, as a whole, has been put up to speed, even though, at that moment, the train of gears driving the spindles from the jack shaft were disengaged. This has been demonstrated to be so, which proves the amount of pressure that exists between the paddle and bobbin when the frame is up to speed.

Fourth, most all fly frames in operation are bobbin-lead.

Therefore, the length of roving delivered by the front rolls must be drawn past this point of pressure, which is the chief cause of the cone belt slipping throughout the set.

The last mentioned is the greatest evil found on all



(From May Issue of COTTON)

A Belt Tightening Device for Pickers.

Editor COTTON:

On all Kitson pickers the cone belt must be given vigilant attention continually in order to make the evener motion sensitive. To get even yardage the cone belt must not be too tight or too slack. That picker cone belts are neglected in many mills cannot be denied.

There is a new device on the market to keep the tension uniform. You just put on an endless belt and it never needs any more adjustments. I had this device attached to all my finisher pickers and it does all it is claimed to do. That it is not advertised is strange indeed.

The device is simple. You just have two holes drilled in the casing under the back cone, which is the fulcrum point. The adjustable or bottom cone is severed from the casing and its journals are attached to the device. Two small weights are hung on each side of the frame and keep the cone belt tension uniform.

I am satisfied of this, first, that it will save cone belting in every mill where the cone belts have been neglected; second, it will save labor; and third, it will make a man more certain of even yardage.

They say it is a southern idea.

Wash (R. I.)

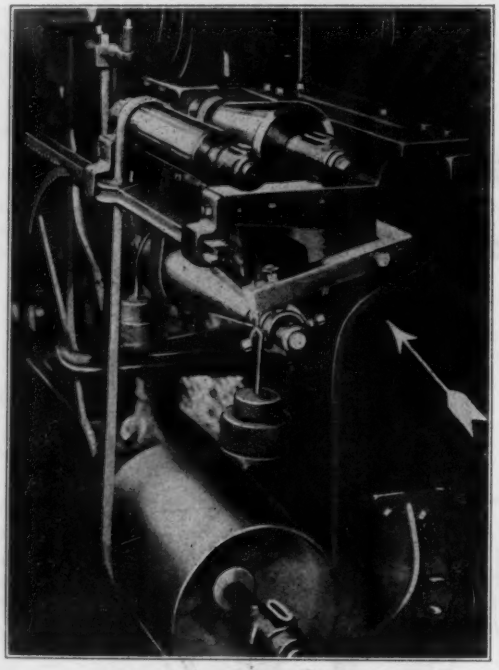
Answer to "Wash" of R. I.—
"That it is not advertised is strange indeed."

"Wash" must have overlooked our advertisements in some of the textile papers. Owing to the overwhelming demand for this device we were compelled to discontinue our advertising in order to catch up on orders.

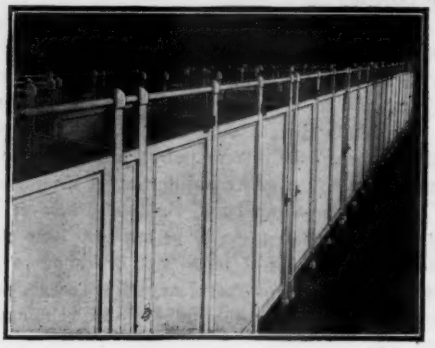
CORN SWINGING IDLER CONE

for

KITSON PICKERS



BAHAN TEXTILE MACHINERY COMPANY
GREENVILLE, S. C.



A Sanymetal installation combining showers and dressing rooms.

Adaptable to Any Arrangement

No. 6 of a Series on "How to Judge Metal Partitions."

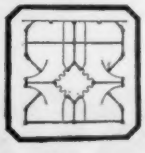
WHEN you choose Sanymetal Toilet or Shower Partitions, you avoid the unnecessary expense of a specially built product to fit your particular purpose and layout.

The illustration above, featuring an unusual layout of combination shower and dressing compartments, shows how perfectly Sanymetal Standard Units fit almost any arrangement. No matter what your proposed plan of toilets or showers, Sanymetal means a considerable saving, in addition to the assurance of fine quality down to the smallest detail.

Built of Armco Rust-resisting Iron. All hardware rust-protected by electro-zinc process. Finished in moisture-proof baked enamel. Base shoes and molds of water-shedding construction. New design doors swing on patented Sanymetal Gravity Hinges. Sanymetal is also made for toilet room wainscoting. Toilet Catalog No. 5 sent on request.

Makers of Sanymetal Office and Factory Partitions.

In the installation shown above



Four showers open into one dressing room

THE SANYMETAL PRODUCTS CO.
986 E. 64th Street **Cleveland, O.**

Sanymetal
TRADE MARK U.S. REG.
Toilet and Office Partitions

bobbin-lead fly frames, and this it is that makes conditions unequal. It was also the sparker for the invention here described for it was realized by the best carders years ago that in order to hold conditions equal on fly frames, the work of drawing the roving past the pressure of the paddle must be removed from the cone belt, in other words, the cone must not be a driver, but a driven, instead. If the accompanying sketch is studied, it will prove beyond a doubt that the claim of some builders turning out cone-driven frames is without foundation.

Referring to the drawings, gear 32 is the differential gear. Gears 30 and 31 are made to revolve around gear 32 by the block 26 keyed to the driving shaft 10. Gear 25 is an internal gear meshing with gears 28 and 29.

Next, study all other compounds or differentials and it will be found that power to drive the bobbins is taken from gear 32, and that it will revolve in the opposite direction to that of the driving shaft if disconnected from the bottom cone.

With this motion, the power to drive the bobbins is also taken from gear 32, but gear 32 will revolve in the same direction as that of the driving shaft, whether or not a connection exists with the bottom cone.

When gear 32 is standing still, gear 23 attains its highest speed. Therefore, in order to give the bobbins their increased or excess speed over the flyer at the beginning of the set, the bottom cone must be made to revolve at its lowest speed. This is done by having the cone belt on the large end of the bottom cone and the small end of the top cone, a condition reversed to that found on all fly frames.

The cone belt simply holds the bottom cone back, and governs its speed only. The cone belt is to the fly frame what the governor is to the steam engine. As the cone belt travels to the small end of the bottom cone, the speed of gear 23 decreases correspondingly. The foregoing is better understood by assuming that gear 32 is made to revolve at a speed equal to that of the jack shaft 10.

At doffing time when the bottom cone is raised, clutch 40 makes the necessary disconnection from the excess speed to that equal to the spindle. This disconnection eliminates the common trouble known as cone backing which often makes a mess for the tender. You need no dog to hold the bottom cone in position.

At the top of lever 47, a slot can be seen. This slot will allow the bottom cone to be raised slightly without making a disconnection. This is necessary when the ends slacken and the bottom cone requires turning.

Please notice also that in order to wind the roving on the bobbins by turning the bottom cone, the cone must be turned in the opposite direction to that when the frame is in operation, which proves that it is a truly driven cone.

The carriage is driven by a spur gear on sleeve 22 and at the same point the number indicates.

It can be seen that the lay or lifting gear need not be changed. The gear meshing with the gear on the end of the bottom cone must equal the number of teeth in the twist gear, for the reason that a larger twist gear drives the front roll faster, and a larger gear meshing with the cone gear will reduce the speed of gear 32 and thus increase the speed of gear 23 and of course the winding-on.

Wash (R. I.)

An Experience in Uneven Laps.

EDITOR COTTON:

"A Remedy for Uneven Laps," written by "R. S. (Ala.)," in the April issue, brings to my mind many peculiar incidents of some 15 years ago, as to what causes uneven laps and the remedy. It was not a case of trying to find out just for the sake of argument—I had the unevenness in my laps and it was giving us trouble in the spinning and weaving, and the superintendent and the spinner had run it down to the carding and it was up to me to find it, so I had to get busy and I hunted the most probable places where I thought it might occur.

I started in the picker room, spending the greater part of my time out there, and noticing every conceivable thing that I could think of that would cause uneven laps. And for one thing I noticed that the evener belts were slipping, and studied out more contact on the driving cone on the pickers, as a means of reducing the slippage, and wrapped the cones as "R. S." says he did. At that particular time I had all, or about all, of the other revolving parts worked over, so the machine was in very good order and the thin places decreased, but they did not disappear altogether for we still had them to some extent. But I found I was on the right track, so I kept pushing on, and I found some of the bearings just a little out, and further I noticed that the apron was rubbing a little on one side at certain places as it was moving around, and worked over that, and every move seemed to make an improvement.

Then I found some unevenness on the front of the picker at the lap pins and the press rolls, and the head block gears, but at the same time I was getting better and better on the unevenness of the laps. About that time a man came along with ball bearings for the aprons, and it sounded good to me, so we purchased a set to try them out. We fitted all bearings on the apron with those ball bearings, and that proved a wonderful improvement on the evenness, but still we found there was room for more and kept at it. By this time I had gotten enough of this product to the spinning room to convince the spinner and the superintendent that I was on the right track and that the work was coming better, and the long faces they were pulling on me were getting shorter and a better humor prevailed among us.

However, I didn't let up; I set in and worked all over my machines again, examining the screens, draft flues, and discharges to the fans, and did considerable humoring of the pickers.

In this manner I rocked along until last year, when I noticed a device that some fellow had gotten up to take up the stretch on the cone belt automatically, as it became stretched by wear, so I purchased some to try out. It worked as they said it would, and with this improvement, and ball bearings on the aprons, I am getting the best, most even lap I ever got, but still at the same time I have to keep the machines well cleaned and oiled to hold what I have gained. You know there is more to do after you have a certain thing worked to a very good stage of efficiency to keep it there than it is to get to this point, for it keeps you guessing on what might be the next weak point to spring up.

"R. S." says that after he covered his cones, etc., it eliminated all of the slippage on the cone belts. It did not on mine, neither are all the possibilities of slippage elimi-

nated with all my improvements, but when the resistance is greater than the power, there is a slip, or a stall, and a stall on the evener belt means a broken lap, or a thin place. Further, says "R. S.," "lost motion causes over 50 per cent of all uneven laps that are made." Then with his cone troubles, and 50 per cent lost motion, he must have been in a very bad row of stumps. I cannot agree with him that lost motion causes 50 per cent of the unevenness; that is, if he is not counting cone belt troubles.

His manner of "lapping" the aprons is not practical, nor theoretically correct. In lapping 1, 3, 2, 4, this would throw the No. 4 lap to be put up at the tail end of the aprons, throwing the weight at the extreme length for the apron to pull up to the beater. It's like taking a bag of sand with a long rope and tying it to a vehicle of some kind for it to pull; the longer the rope the harder it is to pull; so is this fourth lap at the extreme end of the apron.

The best and most satisfactory way we ever got results day in and day out is to never put up full laps at any other place on the aprons than the first and third places. When No. 2, runs out, run No. 1 back to take its place, then put the full lap in the place of No. 1; when No. 4 runs out roll No. 3 back to take the place of No. 4. We consider No. 1 as being next to the beater, and No. 4 as the extreme lap at the furthest point from the beater, with No. 2 and No. 3 between the ends of the apron.

And as to scraping the lap head friction, "R. S." says once a week, but it's like your mother making you take a dose of oil and turpentine, "when you need it." So there you are; it's when it is needed and how often, what the condition of the friction leathers is, and other factors, like judging human nature, you have got to be familiar with the surroundings to give an intelligent answer.

T. A. D. (Ga.)

Study Teamwork.

EDITOR COTTON:

There are two principal ways for a superintendent and his overseers to work together.

One kind of a superintendent works very hard himself and does not leave much of importance for his overseers to do.

The other kind lets his overseers do all they can while he reserves his own time and thought in a search for new ideas, to hunt for hidden leaks, etc.

This latter method gives an overseer a chance to show what is in him. The better overseers a superintendent can gather about him, the more likely he is to make a success. And the best way that has ever been found to bring a man out in any line of work is to let him have the responsibility of the job he is supposed to run, then stand behind him with your experience and with the interest of the other departments in mind—point out to him his weaknesses in a tactful way and at the same time do not lose sight of his good qualities. Like Carlyle, we are firm believers in the maxim that, "for all right judgment of any man or thing, it is useful, nay, essential, to see his good qualities before pronouncing on his bad."

It is but human for a man to like to hear his employer say he is pleased, therefore when a man does well let him know that you appreciate his efforts and if he has the right qualities he will put forth every effort to please you again. There is a marked distinction between what we term "white wash" in praising a man's work and the sincere kind of appreciation.

But to get back to the subject. Suppose it were possible or practicable for an overseer of a large room to hire overseers to take every section he has in the room and be able to pay those men as much or more to run a section than they had been making as overseers. Don't you know that his production would go up by leaps and bounds as a result of having men that not only were good section men but men who understood the value of costly supplies, men who knew what it meant to get one inch more cloth from the loom or one turn more on the front roll; men who would concentrate all their experience on one section and be able to teach the operatives the value of cooperation in side weaving and helping each other in every way possible?

If such an arrangement would greatly increase production, a fact that most practical mill men already know, why not approach this condition as near as possible by teaching the section men as much as practicable what it takes to make an overseer?

The same reasoning applies to the relations between the superintendent and overseers. Suppose the carding is running ahead of the spinning and the carder is patting himself on the back because he is able to stop off on Saturday with his bobbins all full. The superintendent knows, or should know, that he can save his firm money in many such cases by making lighter roving and give the spinning the benefit of the surplus thereby being able to increase the production in the spinning room which will, of course, finally result in a reduction of cost per pound. Because on average counts it costs considerably more to put a pound of cotton through the spinning than it does to put a pound through the carding. Therefore, if either department stops, it is of course saving money to let the spinning stop instead of the carding.

But when you start in to make such a change you certainly will not get the cooperation you should get from the boss carder unless he has been taught team work and the importance of doing anything for the benefit of the firm whether it shows up for better or for worse in his own department.

We are all born more or less selfish, and when shortsightedness is mixed in with a chronic case of selfishness you have a man to contend with that will require pretty good judgment to get him to see into such changes as the one mentioned. That, however, is the superintendent's job and many are the mills running today where little economies like these could be brought about but for the lack of the overseer being able to realize that the mill is in the business of *making cloth* and not roving or yarn.

In other words, the ideal overseer is one who knows that whatever he can do to help the *loom* will help him too, it matters not whether he is carder, spinner, cloth room man or outside overseer. Superintendent (S. C.)

Notice has recently been received of the removal of the Link-Belt Company's Pittsburgh branch office from their old quarters at 1501 Park Building to new and more commodious offices at 335 Fifth Avenue. T. F. Webster, manager of the Pittsburgh office, says that larger space and the more convenient location was made necessary by the volume of business transacted during the past year.

BRUNZOL SOFTENER *gives greater luster and depth of shade to the finished fabric*

BRUNZOL SOFTENER

SCIENCE determines the proportions—hit or miss methods are banished when you use

BRUNZOL SOFTENER

WE have done the experimenting, and this efficient softener has proved itself a practical achievement of the New Brunswick laboratories.

For Cotton, Woolen fabrics, after dyeing.

For goods dyed with Sulphur Colors.

For Sweater stock, and unscoured goods.

For Hosiery, Union goods, etc.

THE NEW BRUNSWICK CHEMICAL COMPANY

REPRESENTATIVES AT BOSTON - PROVIDENCE - CHATTANOOGA - ATLANTA NEWARK, N.J.

R&H CHEMICALS

A POSITION of leadership in chemicals can come only from the same qualities that make leaders of men; but in chemicals the qualities are being constantly measured by science.

R&H chemicals are preferred because of their unvarying dependability.

41st YEAR

GLAUBER'S SALT
SODIUM SULPHIDE

A Few R & H Textile Chemicals—Full List on Request

Oxalic Acid, 99%
Albone, 25 volume Hydrogen Peroxide
Alumina Sulphate, 17/18% Iron
Free Powd. Lump
Antimony Salts, 65%
Bleaching Powder (Chloride of Lime)
Epsom Salts (Magnesium Sulphate)
Blue Stone (Copper Sulphate)
Glauber's Salt
Formic Acid, 90%
Formaldehyde, U. S. P.
Bichromate of Potash
Carbonate of Potash (all grades)
Caustic Potash, 88/92%
Permanganate of Potash
Chlorate of Potash
Yellow Prussiate Potash
Caustic Soda
Sodium Acetate
Bichromate of Soda
Bisulphite of Soda (white powder)
Solozone
Sodium Sulphide (60/62% Broken Pieces and Fused)
Sodium Sulphide Crystal, 30/32%
Tri Sodium Phosphate
Sal Ammoniac, 99%
Zinc Dust
Y. P. Soda
Chlorate of Soda
Nitrite of Soda
Chrome Alum
Barium Chloride

The
ROESSLER & HASSLACHER CHEMICAL CO.
709 Sixth Avenue, New York

Twist on Spinning Frames.

EDITOR COTTON:

Here is an answer for "P. P. (Ga.)" whose letter appeared in the March issue of COTTON under the above title.

In answering the first part of his letter, where he asks if on a spinning frame, does the twist come out of the roving in drafting between the rolls, I should say "No," for the roving will untwist itself during the process of drawing This can be very readily detected by taking the roller cover off the frame while it is running. It can be more easily seen where the draft is greatest between the rolls, that is, between the front and middle rolls.

The second part of "P. P.'s" query needs a little explanation. The most important factor to be considered in putting twist into roving is the staple of cotton. The idea of introducing twist at this step is to give the roving enough strength to be handled at the next process. So the twist should be such that it is just enough to serve the purpose referred to and not more.

I take it for granted that "P. P." is making an ordinary yarn as he did not mention the kind of cotton used. For this class of work, under ordinary conditions, I should advise to use 1.2 as a twist multiplier. The readers are also referred to the writer's letter on the angle of yarns in this issue, for a thorough discussion on twist.

H. H. Y. (Mass.)

EDITOR COTTON:

"P. P.'s" question in the March issue, asking whether twist comes out of the roving in drafting between the spinning frame rolls, has been before the readers quite a number of times, and frequently discussed, but we still can always learn something by continual investigation on the different points brought up.

The way I look at it is—these are one man's views, worth that and no more—that it should be seen from this angle: that the twist is put in in order that the stock may be run through the next process with a degree of uniform regularity as to the evenness, and to do this we must put enough twist in the stock to hold it together so that it will be drafted out evenly; also, that it will not be stretched during the next process as it is performing its function on the course of the cotton through the machinery that it is to come to in making it into spun yarn.

And we must consider what twist is put into it for. In substance it is for the same purpose that a young gentleman and a young lady must have some ties that bind them together in order to be in harmony when they next meet again. Now we will assume that "P. P." is making a 2.40 hank roving. He is making a 17s yarn and though he says 2.15 to 2.75 hank, surely he is not making two kinds of roving for one number of yarn. If he is making an average of 2.40 the proper twist for this yarn, using the 1.20 multiple, would be 1.83 turns per inch, and on this number of yarn the ordinary draft on the spinning frame would be about 7, so assuming that this is what he is doing, he would have $1.83 \div 7$ (draft) $= .026$ turns per inch during the drafting of the roving to account for, and in my way of looking at it, the fibers will still be curling or twisting around one another all the way down to the spinning bobbin in a spiral form, because they cannot become straight and parallel with one another. If they did they would fall apart and the end would not stay up on the spinning frames.

So in passing through the spinning rolls those "ties" have to be there to insure the fibers are secure enough to give that curling effect to hold them in contact for the spinning. Therefore you have only .026 turns per inch to account for and it looks to me as if it is still in there, turning around with the strand as it goes on its journey. Try and draw a picture in your own mind how a little more than a quarter of a turn per inch of twist would be disposed of as it was going through the spinning rolls. Nothing more or less than the .026 turns per inch in the roving still has a tendency to wrap the next fibers.

The next question asked is in regard to humidity. I say that the different localities have quite a lot to do with the humidity to be used. However, I use only from 53 to 55 degrees humidity in making 2.00 hank and 5.70 to 7.00 hank roving and find that to be the best under all circumstances; that is, all conditions of weather, etc.

Another question was, "What is the best twist to use on a fly frame for the conditions given. That depends altogether on the class of cotton used and the condition of the machinery, assuming that it has to be made so it will run well on the spinning. You can make roving ever so good and if the spinning is not in shape for it, it will not run well and you will have to resort to all kinds of methods to make it go, so conditions change things when ordinarily anyone would think everything was all right. I recall one time when the spinning was running bad, and being so accustomed to stumbling over the rock in the path that the frames were judged to be in good enough condition for this particular thing not to be so bad as it was, the carder "caught it," but the thing was still visible in the spinning regardless of what the poor carder could do to remedy the supposed evil in his department by changing twist and other things. Finally we got an outsider to come in unexpectedly and he pointed out the difficulties on the spinning frames; then we went to work on the condition of the frames and by and by the evil began to disappear.

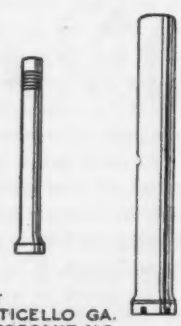
T. A. D. (Ga.)

Where is the Best Place to Size Roving?

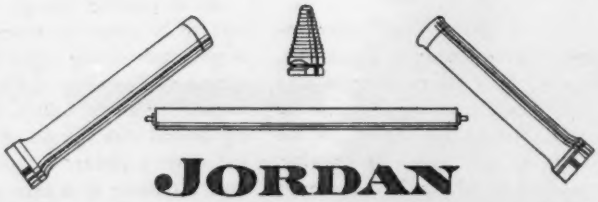
EDITOR COTTON:

Replying to the question of "W. S. B." in the March issue as to the better place to do sizing—on the drawing frames or on the slubbers—it all depends what he is sizing for, and whether his roving goes from his slubbers to the spinning frame. If he has other frames between the slubbers, and he is sizing in order to keep his weights right in the finishing department, I would not advise him to size at either one of them to judge if he was on the right track; that is, after we have established a standard by which we are to keep the roving frame weights. Because at the drawing frames, as well as the slubbers, the roving or sliver is so bulky that we are liable to make a mistake in getting the exact yardage we should get to size from, that it would be likely to vary so much that we would hardly know "where we were at."

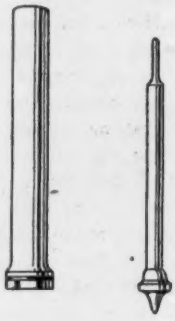
I have kept weights from a production of from 60,000 to 200,000 pounds a week, and kept them satisfactorily, and I never sized at the drawing, or the slubbers, in order



MILLS AT
MONTICELLO GA.
AND TOECANE, N.C.



JORDAN
MANUFACTURING COMPANY
BOBBINS
MONTICELLO, GEORGIA



Made in Dixie

Of a Recognized Quality and Service

GARLAND

IT IS THE GARLAND STANDARD of INSPECTION

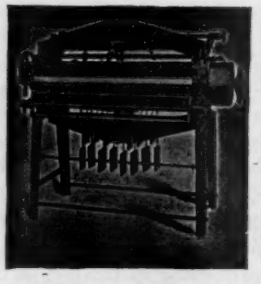
That means a

Perfect Loom Harness

The final inspection which each one of our loom harnesses receives when finished is so thorough and critical that every harness which we send out may be depended upon as being as near perfect as it is possible to make it.

TRADE MARK

GARLAND MFG. CO.
SACO, MAINE



50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES

have been added to the "1912" Cloth Cutting, Folding and Winding Machine which **add at least 50 per cent to its value to YOU.**

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from each bolt of cloth.

It cuts the corners of expenses in every way and leads to more and greater profits.

THE ENORMOUS SAVING WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write us.

J. A. FIRSCHING, 614 Broad St., Utica, N. Y., U. S. A., Dept. "C."

Bradley Stencil Machine

The Bradley Stencil Machine makes Stencils in half a minute at reduced cost of 1-10c each. Write for catalogue and price list.

In universal use by thousands of manufacturers and shippers.

Oil Paper, Stencil Paper and Inks.
Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 60c or $6.00 per doz. Manufacturers of Oil Stencil Papers.

Write for Prices and Samples

A. J. BRADLEY MFG. CO.
99 Beekman Street **NEW YORK**

to regulate my roving weights. Of course I always make it a practive to size those once a week in order to keep a line on how it is coming.

My method of keeping weights is to start in the picker room and have a standard for the finisher man to go by, and allow him a half a pound each side of my standard; all outside of this to be set back and not allowed to go to the cards. Then I find my standard on the roving frames and stick to that, wet or dry; then watch the warper beams and the finishing department weights, and be governed accordingly. These are my main points, though I get sizing reports from the spinning daily, and in connection with it all I find it a very good guide.

T. A. D. (Ga.)

A Remedy for Lumpy Roving at the Slubber.

EDITOR COTTON:

"Y. T.," in the April number, says he is having trouble with thick and thin places, or lumpy roving, at his slubbers. I have just had a similar experience, and thought perhaps the remedy in this case might be of assistance to "Y. T."

My conditions were: 11 x 5½-inch slubber producing .65 hank roving from a 64-grain drawing sliver, using 1-inch middling cotton. Slubber draft, 4.98 with break draft of 1.45 between the back and middle roller; front roll speed, 203 r. p. m.; 12-pound weight on the back roll, 14 on the middle roll, 18 on front; diameter of front roll, 1¼; back roll, 1¼; middle, 1⅛-inches. Rolls spaced, 1⅝-inches back to middle; 1⅛-inches middle to front. Shell rolls in front, solid top rolls middle and back. The cotton was medium for uniformity.

The slubbers ran excellently under these conditions, and I was just about to congratulate myself on hustling the change through to this point, when these thick and thin places caught my eye. Also, the superintendent happened along and stopped to remark that my roving looked like link sausage, which was true.

Going back to the drawing, I reduced my sliver to 52 grains per yard; this reduced my slubber draft to 4.00, also the break draft was reduced from 1.45 to 1.30 by changing the small gear on the back roller. The roll space was changed to: back to middle, 1⅛-inches, middle to front, 1-inch, from bite to bite. All my solid top rollers were removed and placed on a solid surface and tested for crease or hollow centers, and about a third of these had to be removed. The speed of the front roll was changed to 191 r. p. m., and now I am getting almost perfect work from my slubbers. I think "Y. T." is drafting his slubbers too long; he also should see that the sliver from the drawing is okeh. I hope we will hear from him again. A. D. (N. C.)

EDITOR COTTON:

"Y. T. (Ala.)," in the April number, says he is having trouble with thick and thin places in his slubber roving with an 80-grain sliver, and asks for suggestions.

First, let me ask why he has such a heavy drawing sliver? It would be a matter of impossibility to get a set of rolls that would draw this weight of sliver—but "Y. T." doesn't give enough information to start with.

The first thing I see right off the bat is that he is drafting too much on his slubbers. The thing he ought to do would be to reduce his draft down to at least four and still further, if possible. Now it may be that he is short of cards, or he may be running a low doffer speed and carding a heavy sliver. So if this is the case he would find that he could help matters by doing light, quick carding. The writer overcame this same thing at a mill that was on coarse, heavy work, and was short of cards, by taking one end out of the front drawing. That is, instead of having six ends up, using only five up at the back. Of course this cuts down the amount of doublings, and I would not recommend it if there is any other way out, but this would beat what he is trying to do; that is, draft 4.80 on his slubber.

If "Y. T." will give us the following information I am sure that we could help him: number of spindles in spinning room; speed of front roll; number of yarn being spun; number of fly frame spindles, including slubber, intermediate and speeders; number of deliveries on drawing, both back and front; whether rolls are common rolls or metallic rolls; number of cards and cylinder speed; doffer speed; weight of sliver; weight of lap; speed of licker-in; beater speed on all pickers, stating whether beaters are two-bladed, three-bladed or Kirschner; grade of cotton used.

With this information, the writer, for one, would be glad to figure a lay-out for him. And in the meantime I would advise him to give his drawing a thorough going-over and see that his frames are cleaned well, and that all weights are hanging free, and the rolls kept well oiled, being sure to keep all chokes off of the steel rolls at all times. But the best thing that could be done right now is to get the front drawing sliver down in some way, in order to get his slubber draft down around 4.

The roll settings should be about 1¼, front; and the end should be wrapped around the top of the flyer. I have tried it both ways. If he gets his draft right it won't make very much difference, but around the top is right.

The way a mill is drafted has more to do with the quality of product than is generally supposed. My idea is a good, short draft all the way through the mill. These "long draft boys" that have been writing in COTTON are welcome to try it in their mills, but as for me and mine, short draft now and forever.

Suppose "Y. T." tries to see if he can't work his draft something like this: Picker, 4-inches; cards, 100-inches; drawing 6 inches; slubber, 4-inches; intermediate, 5-inches; speeders 6-inches; and spinning 10½ inches.

"Y. T." didn't ask for all this information, but he sent the "S. O. S." call and it is just possible that he might get something out of it that will help until "Wash" and some of the other old-timers can get to him. I am sure that by now they have caught the distress call and are headed in to help him to shore. U. D. (Ala.)

In the April issue, "Y. T. (Ala.)" states he is having trouble with his slubber roving; next, he makes the confession that the weight of his finished drawing sliver is 80 grains to the yard.

As "Y. T." asked for an opinion from me, among others, I would ask him to look up my article entitled "'Wash' Finds Some Heavy Drawing Sliver," in the December issue of COTTON, and read the eighth paragraph.

BLEACHERS!

Better bleached cottons
are demanded by the public.

Solozone-processing
fills the bill at same cost, and avoids
the necessity of cutting prices.

Bleach your goods to a
permanent white without weakening,
of greatest softness and elasticity.

Let us show you.

THE ROESSLER & HASSLACHER CHEMICAL CO.
New York

I would not be in the state of Rhode Island if it had not been for such conditions as there described.

The diameters of the rolls have nothing to do with such a condition. Let me first explain the exact conditions and what takes place between the drawing rolls when running an 80-grain sliver. With such a bulky sliver the top leather rolls of each line of rolls have too much to do. In other words, there are too many fibers in the cross-section of the strand, which holds the top leather roll apart from the bottom steel roll on the back and middle lines. Therefore, the back and middle rolls do not have a firm grip on all the fibers in the cross section of the strand—only a portion of them.

So, a certain portion is drawn in clusters, which accounts for the lumps. This creates the following conditions: the strand coming from the drawing rolls appear to be pulling apart, the action at this point is similar to that of a tight tension. Besides, the surface of the bobbins when at full speed would lead one to believe that the carriage gears were slipping.

Now the only difference in weight of the top rolls is space. If the weights are too light, the rolls should be spread correspondingly.

We reduced the sliver from 80 to 50 grains in the mill referred to in my article. We increased the speed on the drawing correspondingly. We get a little better production on the drawing, 800 pounds more per week on the slubbers for each pair. I am unable to give the figures on the intermediates for the reason that we have too many intermediate spindles, a condition that will soon be remedied. On the fine frames it made a difference of 10 hanks on each pair. So, I wish to send this "S. O. S." call to "Y. T.": Reduce your finished drawing sliver at once to at least 60 grains to the yard; spread the rolls on the slubbers until the web or strand delivered by the drawing rolls will appear even.

Wash (R. I.)

Finishing Cotton Bag Goods.

(*Continued from page 661.*)

it in unskilful hands, and, for this reason, and from the fact that the one-boil in caustic is easy and that anyone can run it without any great cataclysm happening to it, except a condition of general all-around bad work, which doesn't matter so long as the bleachery can get away with it at a price, said one-boil system in caustic appeals to the pockets of the powers that be and has come to stay.

A one-boil system can, however, be made to answer fairly well if the goods are first steeped overnight in diastafor; to carry out this plan the goods must be wet out on a washing machine, in water at 140 degrees F. (no hotter) containing two pounds of diastafor in each 100 gallons and plaited down on a stillage and allowed to lie there overnight. After steeping the goods should be run through hot caustic standing at 2 degrees Tw. (when cold) on the liming machine and run into the kier. This caustic liquor should be made up with 120 pounds caustic soda and 60 pounds of soda ash and enough water to make the liquor stand at two degrees Tw. After the goods are in the kier enough liquor of the same strength should be run in to cover the goods, and the kier should then be boiled for ten hours at 15 to 25 pounds pressure. Please remember that

a *perfect* circulation is essential in the caustic soda boil—with the lime it is not so important.

After boiling, wash well and sour, wash again and chemic at 1 to 1½ degrees Tw., for about five hours.

I know of a bleacher who gets fairly good results by souring the goods first in hot sours instead of diastafor and then boiling, etc., in caustic, as given above. All these quick systems are not necessarily economical, they take more chemicals and involve more risk. Even when caustic soda is used in place of lime, two boils should be given for reasons already stated.

After chemicking the goods must be well washed and squeezed as dry as possible into the finished bins. They should be white enough without souring, if they have been boiled twice they certainly will be. Souring, owing to the almost impossibility of washing the acid all out, impairs the strength of the goods and strength is one of the first requirements of bags. If, however, the goods are soured they must then be washed exceedingly well and mangled through water containing a little ammonia to neutralize all traces of acid.

When the goods are washed into the finished bins from the chemic (without souring) take them up directly through the scutcher without mangling and open them out and fold them down into trucks and run them to the drier and dry them up thoroughly into a truck again—say about 2,000 or 3,000 yards to each truck, or the scutches may be attached to the drying machine and the goods taken direct from the finished bin, through the scutcher and directly over the dryer, without any intermediate trucking, but for obvious reasons, this is not always the most convenient or time-saving.

While the water mangle is one of the most important machines in a bleachery, it should not be used indiscriminately for all kinds of cloth and for all kinds of finishes. It washes off the cloth at full width, and it squeezes the cloth comparatively dry and a chasing mangle fitted with copper drying cylinders makes the cloth still dryer, all of which are good things enough, but it closes the threads by flattening them and this I do not like for bag goods, because the threads being flat, hard and closed, the starch mixture can neither penetrate them nor go between them. It all goes on the surface, and does not adhere to the cloth with the same tenacity as cloth not water mangled; this makes the goods dusty and to have a very artificial appearance.

This may be very easily proved by taking three pieces of bag goods, and (1) chase on water mangle, dry on drying machine, damp and then starch dry. (2) water mangle only and starch wet. (3) dried on drying machine direct from scutcher, damped and stretched and starched dry. Now if these three pieces (I have tried it and know whereof I speak) are taken and filled with the same starch mixture and on the same starch mangle, and dried and calendered exactly alike afterward, the difference in appearance, weight, and feel between them will be quite a lot. For the percentage of filling will be approximately as follows, on the bleached cloth: No. 1, about 18 per cent; No. 2, about 11 per cent; No. 3, about 22 per cent.

Piece No. 2, the piece that was water mangled only, will appear to have considerably more filling than the one not mangled. It will feel thinner and have no "body" to it; in fact, even to an inexperienced person, it will appear artificial and of a much inferior quality. The one that was water mangled and dried (No. 1) will have a better appearance, but feel thinner and the filling will be more on the surface than in the case of No. 3, and it will also have a more artificial look about it. The piece not water mangled at all (No. 3), but simply scutched and dried up before starching will feel much thicker and both look and feel more natural. The threads being less covered with starch on the filled side, and not being flattened, the cloth has altogether a much less artificial appearance in every way. After drying thoroughly, and allowing to lie on the trucks in lots of 2,000 to 3,000 yards to get thoroughly cool, the goods are starched or filled on the back on one or the other of the two following machines: (shown in Figure 1 and Figure 2.)

In Figure 1 is a Tommy Dodd backfilling mangle which starches the goods on one side only and delivers the starched goods into a truck which is, when filled, taken to the back of the cylinder dryer and dried up; this machine will starch the goods at the rate of 200 yards per minute. It is shown in the cut as running the cloth from roll A but it will

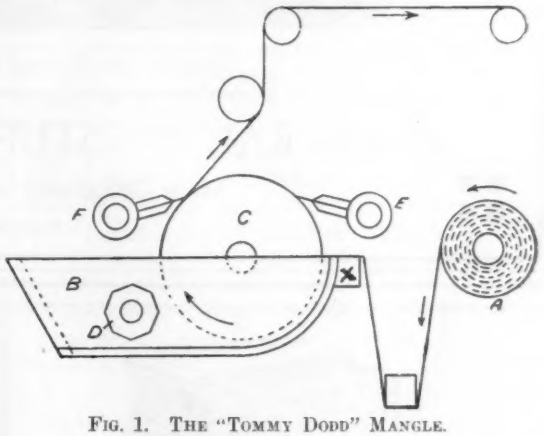


FIG. 1. THE "TOMMY DODD" MANGLE.

save time and handling to run the cloth from the same truck that the dryer dropped it into. To do this the cloth must be run from the truck over the necessary guide rails and over a scrimp bar at X to straighten out all creases. This scrimp bar must be set close to the mangle roll C so as to deliver the cloth tight to it above the starch to thus prevent any starch from getting in between the cloth and the roll. In this machine the cloth A is passed through the starch in the starch box B, following the direction of the arrows, with one face closely applied to the roll C so that it is starched only on one side. A revolving agitator D maintains the regular application of the starch to the face of the cloth exposed to it. A rubber scraper, or doctor, is mounted on the hinged shear E, and scrapes the bare surface of the roll so that it always presents a clean surface to the incoming cloth. On the opposite of the mangle roll a similar *metal* doctor F removes the excess of starch from the back of the cloth and insures the uniform distribution of the starch. This doctor F is also geared so as to give a short lateral reciprocal motion so that it will not always stay in the same place. The amount of starch put on the goods is controlled by the adjustment of the weights on the doctor levers and the inclination of the doctor blade. In Figure 1 is shown a sketch of only the main working parts and nothing of the framework.

Especial care must be taken to have the edge of the

MANUFACTURERS OF

Direct Cotton Colors

Aeroplane View of Central Dyestuff & Chemical Co. Plant.

CENTRAL DYESTUFF & CHEMICAL CO.

Main Office and Works, Newark, N. J.

Established 1898

DIXON'S

SOLID BELT DRESSING

is recommended for a quick, sure cure for slipping belts.

It may be safely used on leather, rubber, or fabric belts without clogging, hardening or cracking the belt, even after years of use.

If applied sparingly at intervals it will preserve the belt and prevent loss of power through slipping. There is no more popular dressing on the market.

Write for Circular No. 34-O and sample.

JOSEPH DIXON CRUCIBLE CO.

JERSEY CITY, N. J.
Established 1827

29 Gauge Steel Fire Proof Shingles

DOWMAN-DOZIER Galvanized STEEL SHINGLES

The beauty, economy and durability of these shingles are well known. We have been making them for 25 years, and their lasting qualities are proven in hundreds of installations.

They are easily installed by anyone with a hammer and nails, they "stay-put," they make a beautiful roof for any building, they are fire-proof, leak-proof and weather-proof—in short, the best roofing investment possible.

The prices are right—the service is prompt. Your satisfaction is assured on any order, large or small. Catalogs sent gladly on request.

Skilled engineers and architects are at the service of Southern mills ready to work out your plans and make valuable suggestions in the use of any of our products, which include:

DIXIE VENTILATORS
PORTABLE ALL-STEEL GARAGES
SLIDING FIRE-PROOF DOORS
METAL FRAME WIRE GLASS WINDOWS
UNDERWRITERS TIN CLAD DOORS AND SHUTTERS
GALVANIZED GUTTERS AND FITTINGS
GALVANIZED PIPE AND FITTINGS
GALVANIZED WALL TIES AND PLUGS
GALVANIZED METAL SHINGLES
GALVANIZED CORRUGATED SIDING
GALVANIZED ROOFING
GALVANIZED PRESSED BRICK SIDING
GALVANIZED CORRUGATED SHEETS
GALVANIZED VALLEY
ROLLS AND RIDGE ROLLS
GALVANIZED TANKS
METAL CEILINGS
METAL CORNICES
METAL SKYLIGHTS
COMPOSITION ROOFING
SLATE ROOFING
ASPHALT SHINGLES
BLOW PIPES
SMOKE STACKS
ETC., ETC.

Dowman-Dozier Mfg. Co.

Manufacturers—Contractors—Sheet Metal Products
ATLANTA, GA., U. S. A.

metal doctor perfectly parallel with the mangle roll and to see that no pieces of grit are allowed to lodge between the edge of the metal doctor and the roll, for it will scratch a ridge all around the bowl which will make a corresponding streak the whole length of the cloth. Also the bowl must be kept absolutely clean by the rubber doctor E—to do this it may be found necessary from time to time to pour a little water from a cup along the face (i. e., the length of the edge) of it. This mangle will starch a very large quantity of goods, as it fills better while running at a fast speed than at a slow one and it does this without any danger of "plucking" or "sand cuts" which are among the many disadvantages of the Scotch mangle. It may be run at a surface speed of from 200 to 300 yards per minute.

After starching the goods should be dried, if possible, on a cylinder dryer which exposes the back or unstarched side of the cloth only to the cylinders or at least for the first eight or ten cylinders. The writer has gotten good results by wrapping the first five cylinders on the top tier which come next to the starched side of the goods with cotton cloth.

The goods, if not too open, can be starched and filled on a "back filling machine" which may be attached to the back of the dryer in such a way that the starching and drying can be carried out in one operation. Such a machine is shown at Figure 2, and works as follows: The starch box G being filled two-thirds full of starch and the machine being started, the cloth passes in the direction of the arrows, the drying machine, the first cylinder of which is shown at F, being the motive power. The roller A

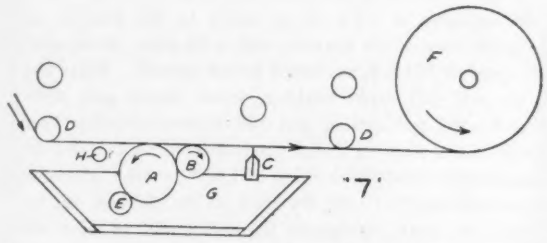


FIG. 2. BACK FILLING MACHINE.

carries round a film of starch, the thickness of which is regulated by the press roll B, which can be adjusted closer to or farther from the roll A. The cloth, after passing in contact with the two rolls A and B, is drawn tightly over the metal doctor blade C, where the starch is spread over the surface of the cloth and the superfluous size is scraped off. A revolving agitator E is placed in the starch box to prevent the heavy clay in the mixture from settling. DD are rollers which may be regulated in height to give more or less contact and consequently more or less starch to the cloth as it passes over the rollers A and B. The small rod H is shown under the cloth between D and A. It is attached to the adjustable rollers D D, and raises and lowers itself with them, and by it the cloth can be lifted entirely free from the rollers A and B, and out of contact with the starch.

The cloth passes direct from this machine to the drying cans at F, the machine being driven from the cans by a belt. It will be noted that the roll A travels in the opposite direction to that of the cloth. It will also be necessary that the first eight or ten cans should dry the goods on one side only as before stated—this of course is to prevent the starch from sticking to the cans.

Some backfilling machines are built with two sets of filling rollers similar to A and B, and a scraping doctor between them, and some finishers prefer to run the goods twice through the machine, drying in between. This makes very fine work indeed and fills up every pin hole. Again, for very low goods some finishers run the goods through the Tommy Dodd wet from the finished bins in the bleach-house, dry them up and starch the second time on the back-filler.

With regard to the Tommy Dodd, the writer has found it advantageous to use a rubber doctor on both sides, in place of a metal doctor, to spread the starch on the back. He used a length of ordinary four-ply three-inch rubber belting and turned it to a fresh side as it wore off. It was

(*Continued on page 721.*)

An Explanation.

EDITOR COTTON:

I wish to acknowledge that the leaving out of the intermediate pickers in the case of "T. A. D. (Ga.)" as he referred to in an article in a recent issue, may have been advisable in his case, while in the case of the mill I am now in, it would not have been so.

As "T. A. D." will possibly remember, the principal theme of my letter in the September issue was to convey a loss of evenness in the yardage of the lap, and in the total of turned back laps. This yard variation causing an extraordinary amount of draft gear changing on the finisher drawing frame, which was not so in the case of the three processes of picking.

I was not in a position at the time of writing before to compare on the same counts of yarn spun, as to the pound break, and used only a standard break of what should be. At the time both mills were on cord tire fabric, each used a different count of yarn, the three-process, 23s yarn from double roving, and the 13s yarn from single intermediate roving.

At the present writing the exact pound breakage of the 23s I am unable to give, except to say that the break on this has always been well over standard in this three-process mill. The 13s that we are now running broke on May 8, 7 per cent humidity at an average of 124 pounds or eight pounds under standard.

We have in our mill a complete testing laboratory, and careful data is kept of the humidity from the bale to the fabric, and also yarn, cable and fabric break. On days that show a higher percentage of moisture content than others, due to outside conditions, our break increases in proportion. We have also found from data kept in the past three years that the evenness of the yarn allows for a greater yarn break, and cable break, due to the evenness of the twist, caused by the use of the even yarn.

Tests were made with three processes of picking, and three processes of drawing, and we raised our yarn break well over standard and our cable break from 13.7 pounds to 15.75 pounds, due to the evenness obtained, as previously mentioned, and on this test alone, as compared, proves my statement.

The general superintendent informed me a short time ago, when our break was dropping off, that he had finally

arrived at the conclusion that if he were to start up another mill for tire fabric, using the same organization as to the counts of the yarn, he would use three-process picking and three-process drawing.

In the manufacture of tire cord fabric, the even counts of yarn when made into ply or cable always gives a maximum breakage. As I have already stated, this becomes a fact in the product we are manufacturing, and it is possible that in the case of "T. A. D." the evenness is overcome in the two extra processes of doubling, on the jack frame and spinning frame.

Years ago mill men thought that the Crighton opener was not of benefit in the manufacture of cotton products, today the triple tandem is advocated by many. Where this process is used an elimination of one process of picking might be effected, but otherwise it is not a detriment if handled in the right way, in affecting the break.

I agree that in certain instances "T. A. D.'s" organization could be used, but in the majority of cases, where cotton grades and staples vary to excess, three processes of picking is a means to an end to get evenness in the succeeding processes. K. (O.)

Export Classification of Cotton Duck.

American exporters of cotton duck have been much concerned recently over what appeared to be unusually large exports of cotton duck to various consuming countries. However, a careful investigation of this subject has proven that for many months export figures on duck have consistently shown exaggerated totals, according to Edward T. Pickard, chief of the textile division, Bureau of Foreign and Domestic Commerce, Washington. In the figures of exports for February to Canada alone, the totals shown are almost double what they actually should be.

The cause of this descrepancy has rested largely on the shippers, it is pointed out, because of improper classifying or inaccurate description of the commodity on the export declaration. For instance, very frequently, "osnaburgs," "cotton fabrics," "barber towels," "curtain materials," "doe skins," and "olive drab cloth" have been described and classified on the declaration as cotton duck.

Every manufacturer and shipper is entitled to know the actual totals involved, says Mr. Pickard, and unless the use of these loose methods is promptly discontinued, intelligent handling and consideration of American duck markets abroad is almost impossible.

Manufacturers, commission houses, and shippers are therefore requested to describe ducks on the export declarations in the following style: Cotton duck, unbleached; or cotton duck, bleached; or cotton duck, colored.

For the benefit of the trade, the Cotton Duck Association of New York, in conference with officials of the Department of Commerce, recently gave the following definition of cotton duck:

> "Cotton cloth of plain weave in which either the warp or the filling or both, is constituted of two or more strands, either twisted or laid parallel (flat), and not weighing less than 6½ ounces to the square yard."

For the purpose in mind, it is urgently requested that only those cloths which might properly be classified within the limits of this definition be so described as duck on the export declarations.

The Department of Commerce has issued instructions to all collectors of customs that declarations which do not give a sufficiently detailed description to permit of correct classification under unbleached, bleached or colored, be returned to shippers for correction, and that exporters should be encouraged to insert in the column "Class No. of Schedule B" on the declaration the proper class under which the articles should be included. Only items described as duck, canvas, or tire fabric on the shipper's export declarations should be coded under classes 3021, 3022, and 3023 of Schedule B, and osnaburgs, cotton bagging, fabrics, window awnings, etc., which have been classed in many cases as duck, should be coded under classes 3031 to 3071 as "other cotton cloth," say the instructions.

That Lumpy Slubber Roving.

EDITOR COTTON:

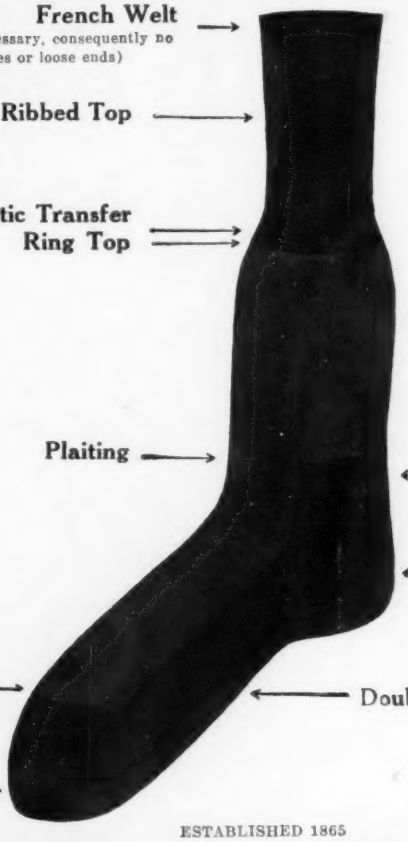
Referring to the letter of "W. D. (Ala.)," a copy of which was sumbitted to me, in which he asks for further information regarding the lumpy slubber roving question brought up in my letter in the April issue, I will say that my contention with the management was that the drawing was too heavy for the slubber rolls to pull, and there was no possible reason why it should be that as there were enough first and second drawing heads equipped with metallic rolls to take care of all the cards would do if the sliver was cut down to 65 grains.

The production of the cards with a 65-grain sliver, with a doffer speed of 13 r. p. m., would be 171 pounds, and the production of the drawing with a 65-grain sliver, and a roll speed of 300 r. p. m., would be 220 pounds. There were in the mill 191 cards working, which would give 32,661 pounds card production, and 156 finisher drawing heads giving a total drawing frame production of 34,320, or a difference in favor of the drawing of 1,659 pounds. Hence my contention was that with the draft on the slubbers cut to 4 or less, the work throughout the mill would be more even and stronger, and my reason for writing to COTTON was to get the view of other practical carders, and probably the management would at least give it a fair test. I am no longer connected with the mill in any capacity, but the articles brought out by this question will be read by others who are at the mill, and they are interested in them and will watch COTTON for the discussion. I will state that the machinery is kept in A-1 condition for cleanliness and oiling, and they use a good grade of cotton, 1-inch, for yarn ranging from 5s to 16s. Y. T. (Ala.)

Ernest Christian Klipstein, secretary and treasurer of A. Klipstein & Company, president of E. C. Klipstein & Sons Company, and identified in an official capacity with a half a dozen well known chemical manufacturing or distributing firms, died recently at St. Vincent's Hospital, New York City. He was 72 years old and is survived by his widow and three sons, Ernest H., Gerald P., and Kenneth H. Klipstein. Mr. Klipstein was internationally known as a pioneer in the truest sense, and made innovational contributions to the American chemical industry, especially in the textile and leather fields.

KNITTING SECTION

NEW MODEL H-H



Made upon two sets of needles

Needles without latches or rivets

ESTABLISHED 1865

SCOTT & WILLIAMS

INCORPORATED

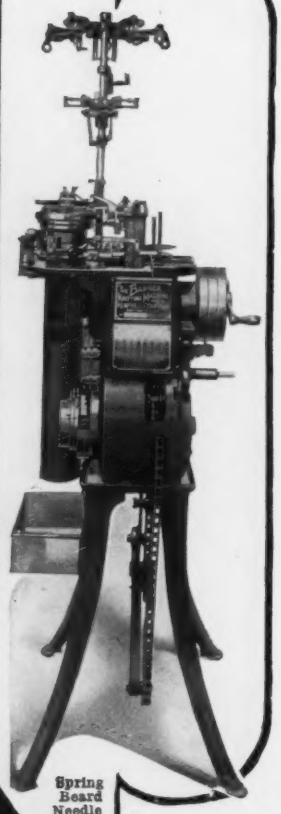
Hamilton, Ont.
Main and McNab Streets

366 Broadway **New York**

High Point, N. C.
401 Wachovia Bldg.

The Banner

Full Automatic Hosiery Machines



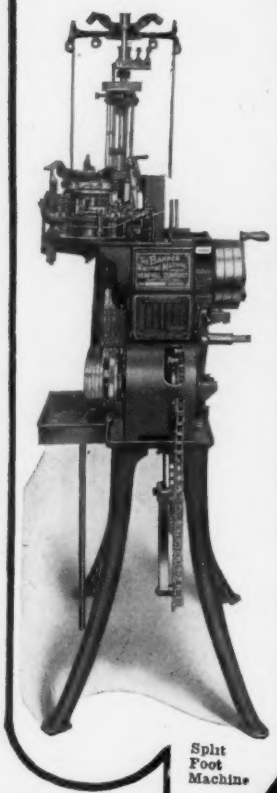
Spring Beard Needle Machine

Simplicity
Quality
Speed
Production

All Parts Accessible from the Front of Machine

We have just placed on the Market two new models– The Spring Beard Needle, built in sizes of 3" to 3 3-4" diameter, and a new model –Split Foot Machine, built in sizes of 3 1-4" and 3 1-2" diameter.

Write for descriptive catalog



Split Foot Machine

HEMPHILL COMPANY

MAIN OFFICE AND FACTORY PAWTUCKET RHODE ISLAND

TRADE MARK

SOUTHERN OFFICE and SHOW ROOMS
912 James Bldg.
CHATTANOOGA, TENN.

PHILADELPHIA OFFICE and SHOW ROOMS
208-9-10 COLONIAL TRUST BLDG.
PHILADELPHIA, PA.

Knit Underwear Men Meet at Atlantic City

Endorsement of a plan for the establishment of a fellowship at the Bureau of Standards in Washington, as a definite step in an effort looking toward standardization of sizes for knit underwear, was one of the features at the annual meeting of the Associated Knit Underwear Manufacturers' of America, which was held at the Hotel Traymore, Atlantic City, on May 14th and 15th.

This question is generally believed to be, as one manufacturer classed it, the "thorn in the side of the knit underwear industry," and has been discussed for years without any definite decision on the part of all factors concerned. It is believed, however, that the establishment of a standard system of sizes with government approval behind it will carry much weight in its adoption.

The convention consisted of two sessions on Monday, the 14th, and final group discussion meetings on the 15th. At the morning session on Monday, President L. U. Lynt called the meeting to order, and among the business transacted was the report of the secretary and several committees. A code of ethics was also proposed and adopted for the organization.

In his annual report, Secretary Roy A. Cheney indicated the remarkable growth of the organization within recent years. He cited instances to show that the association has rendered real and helpful service to its members. "The day has passed by when an association can simply be a get-together proposition with one or two jollifications a year, an empty shell with large promises and but little to show in the way of concrete achievements," said Mr. Cheney. "Today the trade association must serve its members day in and day out, and bring to those members who use it a real return for their investment in dues."

Mr. Cheney outlined the service of the credit department, the experience exchange, sales letters, cost work, monthly order and production reports, and collection department. He also urged the members to take advantage of and use the Association. Unless this is done, he said, "you are missing the possibilities of returns which you can get in no other way. Your association is a part of your organization; the secretary and other employees are on your payroll. If you do not use them you are passing up many opportunities for making and saving money."

The report of the cooperative advertising campaign activities showed splendid progress in this respect. Robert S. Cooper, of the Cooper Underwear Co., chairman of a special committee to investigate the various "truth in fabric" bills which have been introduced, reported that the committee was opposed to the legislation, and this report was adopted by the association. The report stated that if written into law, either by Congress or state legislatures, the proposed legislation would not give the public the protection that they expect from it; in fact, it would remove many safeguards at present enjoyed by the public."

It was announced that the executive committee had authorized the establishment of a cancellation service for members and members receiving unjust cancellations were urged to notify the secretary.

A luncheon served in the Submarine Grill of the Hotel at 1 o'clock Monday was a delightful occasion, and Dr. Gus W. Dyer, professor of social science, Vanderbilt University, made an address on "The Law of Supply and Demand." John D. Strain, of the Associated Employers of Utica, addressed the morning session on the subject of educating employees to understand business and economic conditions.

The afternoon session was devoted to a discussion of several subjects of pertinent interest, among these being the question of standardization of size measurements. In this connection, the following interesting remarks on this topic were prepared for and presented during this discussion:

Standardization.

"From the first season when union suits were put on the market to the present, one of the greatest loads the garment has had to carry has been the lack of standardization of sizes and models.

"The average man buys, or some woman member of the family buys a unionsuit as a matter of necessity. There is little of style or pattern to appeal to a man's vanity in underwear which will cause him to buy, as he does in shirts and other furnishings where he sees something he likes whether he needs it or not, which always gives him an ample supply ahead of his needs. *A unionsuit is bought when the weather changes,* or when a man finds his supply all soiled or entirely worn out. The first suit is usually purchased 'just to see how it will fit.'

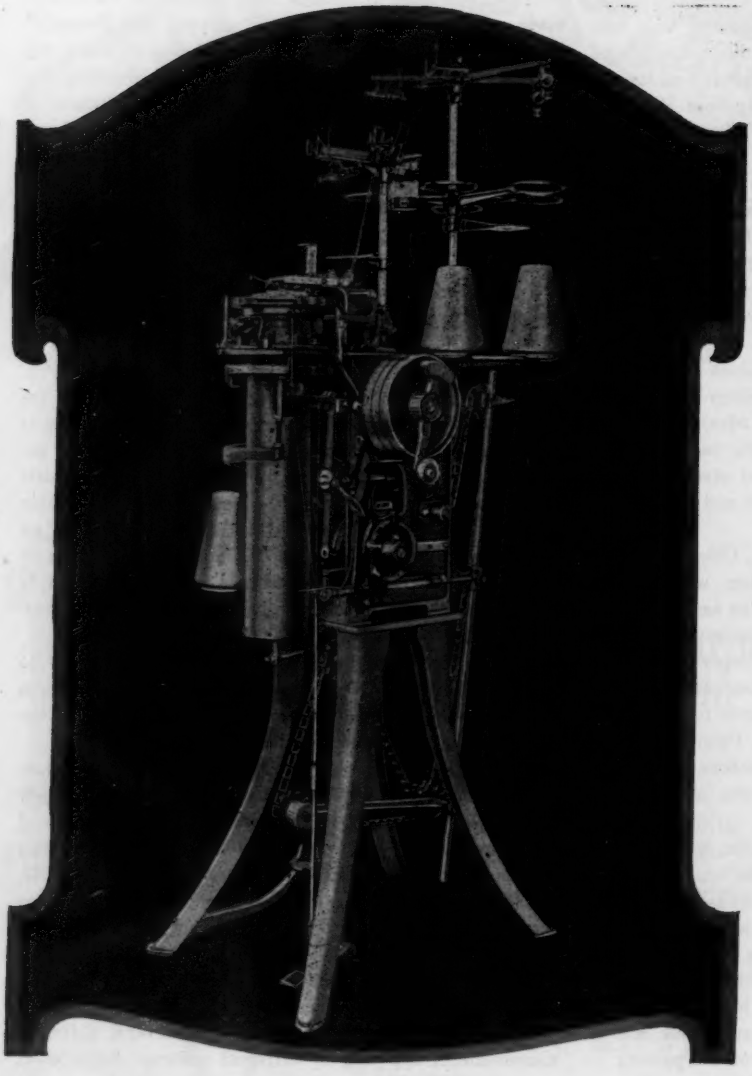
"If the size 40 he buys fits satisfactorily, he returns to the store for another suit of the same size. If the salesman gives him a suit of another brand it is very often that the garment is not the same size at all and does not fit.

"Here's an illustration of what might happen in a case of this kind. If the customer puts on the suit and goes out for his day's work and the trunk measurement is short and he is sawed and irritated all day he is likely to go back and demand a size 44. The salesman may talk him down to 42, but this time gives him a garment from the same maker as the first one bought which will be as much too large as the other was too small.

"Take the garment commonly known as 'stout,' now known by at least two other names. The *same* garment is known by three different names with several different measurements applying by different makers. Some make stouts with trunk measurements same as regulars, while others make shorter trunks than regulars. And then again, manufacturers differ on the length of sleeves and legs in this garment.

"About the same condition exists in the garments known as 'slims' and 'longs' and 'talls.' With all these different names or terms to describe the same garment and with all the different measurements on these same garments it is difficult for the consumer to get a unionsuit that fits him perfectly, unless he gets the same brand each time, which is not always possible.

"Another outstanding difficulty is the difference made by makers in the various models. As an illustration take ¾ lengths: This is a subject which puzzles practically every merchant, retail salesman and consumer in the country. One manufacturer, after interviewing several hundred merchants, retail salesmen and consumers and putting to them the question of what constituted a ¾ length leg in a



WILDMAN
THE WORLD'S STANDARD

Wildman Spring Needle Knitter

Accuracy of operation is an outstanding feature of Wildman Spring Needle Knitters.

This accuracy has enabled the growing number of hosiery manufacturers who use them to market a product of superior quality, closely resembling full-fashioned hosiery.

Use of Wildman Knitters assures a hosiery output that meets a ready demand.

We are now able to sell Wildman Spring Needle Knitters in all foreign countries.

On request we will send the "Wildman Spring Needle Knitter Machine Instruction Book" giving detailed information and description of every important part of the machine.

We have issued a very complete and informative book, "The Science of Knitting"—Price $3.00.

TRADE MFG MARK

WILDMAN MFG. CO.
NORRISTOWN, PA.

unionsuit, found that the opinions ran all the way from just below the knee to two inches above the ankle bone. This shows plainly that there is a variation of opinion from five to eight inches in just this one model.

"Just another horrible example of the extent of the variation in some lines of unionsuits, two nationally known lines of underwear show a six-inch diffierential in the trunk measurement of their 'stout' in the same size.

"Another important consideration in the matter of standardization is the retail clerk. Many stores carry two or more brands of underwear. Can we expect him to properly fit a customer when he is obliged to carry several size standards in the back of his head? No matter how intelligent a clerk may be or no matter how good a memory he has, he is bound to be confused with such a variation of standards.

"Statistics show that over 65 per cent of men's underwear is purchased by women. The retail clerk cannot measure a woman for her husband's or her son's unionsuit, but if one standard of sizes and models were used by all manufacturers, the clerk could, if the man wore a size 40 in one brand, fit him equally as well with the same size in any other.

"The same condition has existed in other industries, and by cooperative work in the national organization, has been adjusted and standardized. One of the outstanding industries that has accomplished standardization is the shoe manufacturers. There was a time when the shoe industry was as widely separated on sizes as unionsuit manufacturers and today they have agreed on sizing, much to the benefit of all concerned. The hosiery industry is also working towards standardization, and I understand that considerable progress has been made.

"If shoes, which are sized down to the smallest fractional parts of inches, and the fitting is effected by shape and the last of the shoe far more than the models of unionsuits, it does seem reasonable to expect that unionsuit makers can and should get nearer together than full inches in the sizing of their garments.

"We must realize fully that each maker has a well grounded opinion and reason for making his garments as he does, and this no doubt is based on his experience over a period of years. However, it is also reasonable to suppose if our Association will approach this problem with open minds, measurements, names and models can be worked out that will standardize unionsuits and result in a bigger and better unionsuit business for the entire industry.

"If our association, representing as it does the makers of the better unionsuits of the country, will standardize their sizes and models, it will immediately become the standard by which all merchants will buy and sell, thereby putting manufacturers on the defensive who do not follow this standard and making more friends for the unionsuit among consumers."

Another subject discussed was the possibility of having the right name to describe each standard style of knitted underwear.

"From the looks of things one group of manufacturers certainly played 'in luck' or else some long-headed man at the beginning of things realized the wonderful sales advantages that would accrue by associating the armless, knee length, woven union or two piece suit with the word 'athletic.'

"Athletic suggests good health, out-of-doors, full of pep, the ideal that we all seek and unfortunately for the knit underwear manufacturer the word 'athletic' has become almost synonymous with the thought of this style of underwear.

"From the check-ups we have made in various stores thousands of consumers have stepped up to the counter and have asked for an athletic two-piece or athletic unionsuit with the firm intention of obtaining a knitted garment without sleeves and of knee length, but the clerk instinctively in most of these cases has pulled out a suit of the other kind from his shelves and sold it.

"Having placed this picture before you let us just imagine for a minute that you go into a store desiring a knitted unionsuit or two piece suit of low neck, no sleeves, with a cuff on the drawers portion that fits snugly just below the knee. How are you going to explain what you want without giving a minute description of details? Think how much simpler it would be if that style of suit had a name in the knit underwear trade—a name that meant just that thing and nothing else so far as style is concerned. Then you could come in and ask for it with just one word the same as you ask for a collar style or the same as you ask for a No. 3 Prophylactic tooth brush.

"The style name can be just the same for a unionsuit and for a two piece so there would be no discrimination on that score.

"Why could not our advertising department in cooperation with our advertising committee and the members of our industry work out a list of names so that each style of garment has a definite name? It would seem that by giving the styles definite names and by giving these names a little publicity at least to the retail trade that it can be made the means of selling thousands of suits of underwear.

"First, because the naming of styles is new.

"Second, because the naming of styles makes it easier for the consumer to buy the same thing the second time.

"Third, because these names can be of such a nature that they will assist in the sale of each style.

"When these various names have been determined there are many possibilities of making use of it by the advertising division of our industry to the profit of retailers because of the ways in which we can use it to produce increased sales of knitted underwear and the benefit of the manufacturers because of our ability to concentrate demand upon the types of underwear that sell in volume and that can be manufactured to best advantage."

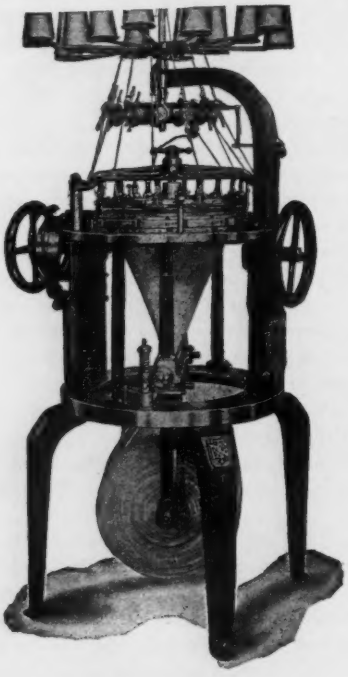
The election of officers was postponed until the semi-annual meeting in November.

The Tuesday sessions were devoted to discussions in the retail group and the fleece group.

Another pertinent topic discussed was the question

What Is Wrong with the Knit Underwear Industry?

Previous to the meeting, Secretary Cheney had secured written opinions on this question from six authoritative sources representiting various factors in the industry, and these were distributed for consideration. A summary of the chief points expressed in these six articles as contributing to the condition of the knit underwear industry is interesting, and the following paragraphs contain the chief thoughts brought out in each of the six opinions.



PRECISION

Successful knitting depends on accurately cut Cylinders and Dials.

For many years we have been equipped with special dividing heads from which we have manufactured Index Plates unsurpassed for accuracy.

The Cylinders and Dials resulting from such superior methods are then hardened and scientifically tested.

This careful procedure guarantees a precision and durability resulting in the consistent production of faultless even fabric.

TRUMP BROS. MACHINE CO.

Successors to

NYE & TREDICK CO.

WILMINGTON, DELAWARE

Cable Address—Trumpbro—Wilmington
Southern Agent—H. F. Booth, Cheraw, S. C.

BRINTON BODY MACHINES

Plain or Automatic

Built in all sizes up to 24 inches. In all cuts up to 14 needles per inch.

You owe it to yourself to investigate this machine.

We also build all styles of Hosiery Ribbers and Knitters and various other circular machines for all kinds of knitted articles.

Samples, prices and particulars on request.

H. BRINTON COMPANY

Philadelphia Pennsylvania

One writer was of the opinion that the main difficulty is that the retailer is not sold thoroughly on knit underwear, and does not give to this merchandise the attention that it merits; furthermore, he said, the salesman for jobbing houses are not thoroughly sold on knit underwear, and concentrate their efforts to items on which sales arguments less difficult than those required for knit underwear are necessary. He said also that a lack of stable prices in the business has done much to confuse jobbers and the fact that some mills have been unable to maintain prices has done much to retard commitments.

This man's opinion as to over-production was that this was not the fault of the individual producers, but a natural consequence of the war period, and a direct effect of surplus machinery acquired during the time of peak production. He declared that the demand for silk cloth underwear is a demand created by the producer of that product, and that the problem of the knitter is to re-create and re-stimulate the demand for the knitted article.

The second opinion considered stated that "a good many underwear manufacturers and more especially their salesmen, belittle their own business and are doing more advertising for the cut garment manufacturer than they are for the knit goods manufacturer. * * * * If the knit goods salesman would become an optimist instead of a pessimist he would help his manufacturer a great deal." This man also deplored the tendency to "be unduly smart and try and beat your competitor." He said this was an old custom, and that as the far-sighted manufacturer came along with a satisfactory product, it made it more difficult for the old-timer to dispose of his inferior product except to cut the price, and that this tended to keep the price down all along the line. It was this man's opinion that "if there were a so-called dominant factor in the knit goods business as has been developed in certain other textile industries, it would appear as though it would have a stabilizing effect on the market."

"Over-production and resultant over-competition" is the suggestion of the third paper, which attributes the over-production to "the growth of the nainsook underwear, in supplanting the male use of knit goods," which has also "had its counterpart in the amazing change of the character of ladies' underwear." An over-development of the industry was attributed to the ease with which new workers for most of the operations may be trained, and the rather limited amount of capital required to furnish a complete equipment. "More highly concentrated financial and mercantile control of individual plants" was suggested. "The knit goods manufacturer must look for ultimate relief to a mercantile authority who will direct the character, quantity, and quality of the product, and see that it is distributed regularly to those who will pass it on at the lowest possible cost to the consumer."

Altogether too meager returns constitute the most general complaint against the underwear industry, the fourth paper declared, one reason being too much derogatory competition, with a disregard for actual costs, but making prices "simply with an eye single to beating the other fellow and keeping the mill running." This often leads to disastrous results sometimes not apparent until the end of the year. "Instead of knowing each week or each day exactly where he stands, the manufacturer gambles that he can make his product as cheaply as his comptitor, who may possess advantages of which he knows nothing, with the inevitable result," it was pointed out. This lack of knowledge as to costs is supplemented in many instances by the handicap of antiquated plants and equipment, and a failure on the part of some mills to cooperate in developing new ideas, leaving this too much to the machinery manufacturer. The matter of manufacturing and distributing a wider variety of lines was suggested for consideration, resulting in the possible combination of mills making all lines comprehend in a furnishing goods department.

Educational advertising was heartily encouraged and suggested to teach the user the desirability of paying for goods according to quality rather than demanding goods at a price. The question of selling direct to the retailer was mentioned, it being pointed out that many of the most conspicuous successes are manufacturers of underwear selling to the retail trade exclusively. The possibility of selling through a commission house rather than one's own agency was presented. The necessity for keeping up with the signs of the times and development of demand was also pointed out as essential.

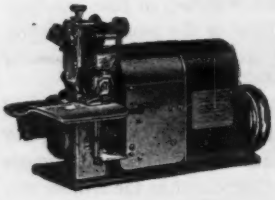
Too many styles and not enough style—in other words, too many numbers in most manufacturers' lines that don't mean anything and not enough numbers that are distinctive—this was suggested as one difficulty. "Most every knitter's experience will show that 75 per cent of his business is done on 25 per cent of the numbers shown" it was pointed out, and the need is something new to talk about from time to time. "You can count on the fingers of your hand, almost, the innovations of design that have taken place in the underwear field in the last ten years." Lack of use of the color motif, failure of standardization of sizes, a failure to keep in touch with the retailer's point of view, lack of recognition for export trade—these were other contributing factors, it was stated.

"Nainsook"—thus the final paper considered analyzed the difficulties of the knit underwear business, pointing out the tremendous strides which the cut-and-sewn athletic underwear has made, and what it has done to put the skids under the knit underwear industry. It was stated for the past twenty years the production of knit underwear has been steadily increasing out of proportion to the normal increase in population, and that this, together with the growing popularity of other types of underwear, which necessarily cut down the demand for knit underwear, resulted in an over-production of the latter.

"The two things necessary for the knit underwear industry to do, and do at once, if it wants to stay on the industrial map" are: 'First, to put every ounce of energy and all its resources behind the present cooperative advertising campaign in an effort to regain some of the business it has lost, and second, to find additional outlets for its product in the markets of the world. If it is impossible to sell in this country all underwear that is being produced, the obvious thing is to develop the export business to absorb some of the surplus production."

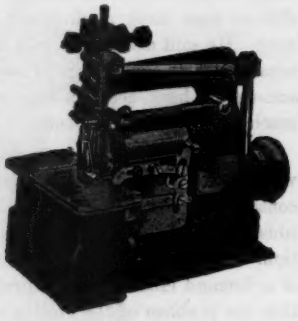
Whitehead, Emmans, Ltd., Montreal and Hamilton, Canada, have been appointed Canadian agents for The Philadelphia Drying Machinery Co., Philadelphia, Pa., manufacturers of the "Hurricane" line of drying, dyeing and finishing machinery.

MERROWING



MERROW
Reg. Trade Mark.

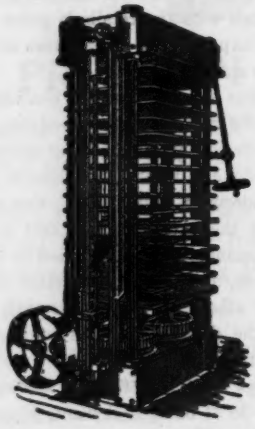
The Merrow High Speed Overseaming Overedging and Shell Stitch Machines.



MERROWISE FOR EFFICIENCY

IT MEANS: MAXIMUM PRODUCTION
MINIMUM EXPENSE
UNEXCELLED QUALITY OF WORK

THE MERROW MACHINE COMPANY
ESTABLISHED 1838
16 LAUREL ST., HARTFORD, CONN., U. S. A.



RELIANCE
Hot Plate Screw Press
FOR
Hosiery and Underwear
Write for Catalog and Prices
Reliance Machine Works
FRANKFORD, PHILA.

JOSEPH T. PEARSON & SONS CO.
MANUFACTURERS OF
BONE DRY
HOSIERY FINISHING BOARDS
THAT WORK ABSOLUTELY SMOOTH
PROMPT SERVICE—RIGHT PRICES
1815 E. Boston Avenue, Philadelphia

GENERAL MACHINE WORKS
YORK, PA.
Manufacturers of
Circular Rib Knitting Machinery
Cylinders and Dials

Among the Knitting Mills

Richmond Hosiery Mills, Rossville, Ga., will erect 24 modern houses for employees. Contract has been let to the Minter Homes Company, of Greenville, S. C.

Lotus Hosiery Mills, Inc., 3rd and Cumberland Streets, Philadelphia, Pa., have been organized to operate a mill on seamless silk hosiery. Goodman Brothers of New York will act as selling agents.

Poppy Knitting Mills, Newark, N. J., have filed notice of organization to operate a mill on outerwear. Harry Fischbein heads the company.

Maryland Silk Hosiery Co., Havre De Grace, Maryland, have been formed to establish and operate a mill. The company is headed by M. H. Fahey, George T. Pennington, W. P. West, Michael W. Eahey, and L. C. Pohl.

Officials of the Oak Lane Kitting Mills, Inc., of Philadelphia, have effected the purchase of property for use in the erection of a plant in Murphy, N. C. A. C. Richmond, president of the mills, is arranging for the details. The Oak Lane Mills, Inc., is a reorganization of a philadelphia concern of the same name, with new stockholders and new capital. The company manufactures ladies' fine knit underwear bearing the Oak Lane trade mark. The building to be constructed will be of brick, mill type construction 70 x 170 feet.

The plant of the Taubel-Scott-Kitzmiller Company will install additional machinery which will give employment to 75 more operatives.

Loudon Hosiery Mill, Loudon, Tenn., is installing 40 machines, which are expected to increase the capacity to 1,000 pair of hose daily.

The Nebel Knitting Company, Charlotte, N. C., has been incorporated. Charles L. Okey is president, R. J. Walker is vice-president and J. H. McEwen secretary-treasurer. These men are interested in the Charlotte Knitting Company. William Nebel, manager of the Atlas Silk Hosiery Co., of Paterson, N. C., is also largely interested in the new concern, and will sever his connection with the New Jersey manufacturers and remove to Charlotte to assume the management of the new concern. Ladies' full-fashioned silk hosiery will be manufactured.

Grantville Hosiery Mills, Grantville, Ga., has awarded contract for the erection of a 56 x 106 foot warehouse, of brick construction.

The Art Knit Wear Co., Brooklyn, N. Y., has been formed with a capital of $9,000, to establish a local knitting mill, for which plans are being perfected. The company is headed by A. and P. Magidson, and is represented by Samuel Schleimer, 277 Broadway, New York.

The Largman, Gray Co., 3390 Frankford Street, Philadelphia, Pa., has commenced the erection of a new knitting mill at Kensington and Torresdale Avenues, to cost about $300,000, including machinery. It will be four-story and basement, with one-story power house, adjoining.

The Robro Knitting Mills, Inc., New York, N. Y., has been organized with a capital of $10,000, to operate a local plant for the manufacture of a general line of knit goods. The company is headed by A. and J. Rosenzweig. It is repesented by Peter Klein, 253 East Seventy-second Street.

The Rheinauer-Roth Knitting Mills, Inc., New York, N. Y., has arranged for an increase in capital from $10,000 to $40,000, for general expansion. Headquarters are at 42 West Eighteenth Street.

The Lloyd Knitting Mills, Inc., New York, N. Y., recently organized with a capital of $10,000, will operate a local plant for the manufacture of a general line of knit goods. The company is headed by R. and H. Lowenberg; it is represented by L. J. Feinstein, 47 West Thirty-fourth Street.

The Royal Knitting Mills, Inc., 846 West Jackson Boulevard, Chicago, Ill., has acquired a three-story and basement building at California Avenue and Twentieth Street. The plant will be remodeled for a new knitting mill, providing a total floor area of about 55,000 square feet, to be used exclusively for this purpose. Equipment will be installed at an early date. Herman H. Newberger heads the company.

Marshall Field & Co., Chicago, Ill., have taken over the Saifert Hosiery Mill, Philadelphia, and will make a number of improvements for increased operation. The plant will have a total of 250 knitting machines of various types, and will give employment to more than 200 operatives for initial production.

The Hollywood Knitting Mills, Inc., New York, N. Y., has been organized with a capital of $50,000, to operate a local plant, for which plans are being perfected. The company is headed by E. A. Meyers and A. G. Juskowitz. It is represented by D. W. Kahn, 120 Broadway.

The Knitwear Specialty Co., Stamford, Conn., has filed notice of organization to operate a knitting mill at 543 Main Street. Elias Weinstock, 40 Holly Place, heads the new organization.

The Oak Knitting Co., West Division Street, Syracuse, N. Y., has broken ground for a new four-story mill addition, to cost about $50,000, and plans for the early installation of equipment. The structure will be 50 x 105 feet.

The Industrial Hosiery Mills, Inc., Mohnton, Pa., will commence improvements and extensions in the plant of the the Wernersville (Pa.) Hosiery Mills, recently acquired, and purposes to have the plant fully equipped for early operation.

Light, in all of its phases, will be considered in a new magazine just started by the National Lamp Works of the General Electric Company, Nela Park, Cleveland, Ohio. This magazine, whose name is "Light," is a conjunction of four periodicals hitherto published from Nela Park. Dr. Charles Aubrey Eaton will act as editor-in-chief, with a supporting corps of assistants from the ranks of the National engineers. The first issue was published recently, and contains much of interest in connection with lighting in several phases.

Prominent in the recent campaign for a new hospital for Bristol, Conn., and generous contributors to the fund, were Fuller F. Barnes and Charles T. Treadway. Mr. Barnes is vice president of The Root Company, and Mr. Treadway is also associated with that company. The hospital campaign was brought to a successful conclusion and a splendid structure will be erected.

The Yarn Market

The past month in the Philadelphia yarn market, as reported in these columns, has been a period of continued and noticeable reductions in price, a continuation from the condition prevailing during the previous month.

Price reductions were frequent and numerous throughout the month, affecting, as it seemed, more particularly those counts in most general use and demand. 30s single warps, quoted here last month at 59½ cents a pound, as of April 17, were off to 54 cents on May 17; on the latter date two-ply skeins, quoted in April at 51 cents for 20s, were down to 44 cents for the same count. 20s two-ply warps had receded from a position of 51½ cents on the previous date to 45 cents on the 17th of May.

Business continued extremely dull in the market, according to reports, with offerings for small lots being about the only things transacted on.

The first week in the period reported here, and its predecessor, were generally accorded to be the fullest period of that duration witnessed in the market for many a moon. Reductions on the whole averaged around a half a cent, and some places, where yarns were not in the more prominent groups, quotations were lowered a penny. The business done seemed to be sporadic, when effected, and some dealers were favored with periods of perhaps "one consecutive day" of activity, but on the whole the market was in a state of ennui with regard to inquiries and orders.

The attitude of southern spinners seemed to be one of unconcern, not, seemingly pressing their products for disposal, and it was reported as general opinion that if they could but wait the market out, they would continue in the controlling seat therein.

Our second week saw slashes of between a cent to three cents, with a continued dullness in demand. As to the causes of the continued reaction, the disturbed condition of grain, sugar, stocks, cotton, etc., has been responsible for a more or less bearish sentiment in yarns. On the other hand, other factors felt this reaction was only a readjustment in values that was necessary and inevitable, and that once established on a firm foundation, the markets would be in a better position to receive the larger volume of business to come in the fall.

One feature of the readjustment of yarn rates that was noted was that it was very orderly, with very little if any "distress" yarn being unloaded onto the market by any factors, either consumers, dealers or spinners.

Another session of price reductions with a considerably wider fluctuation was noted during the third week of the period, reductions going from a cent to as much as four and a half cents during the six days of trading, with a continued absence of business.

The fourth week, in which this is written, witnessed still further reductions in price, bringing the general position of the yarns to that indicated in the appended list of quotations. It was a feeling that was generally held, however, that the market is settling itself, shaking out the inconsistencies and irregularities, and that with a stable basis once more established, better conditions would prevail for all concerned.

Following are quotations on the Philadelphia market on May 17:

Single Skeins.

4s to 8s	39	20s	44
10s	40½	24s	46½ @47
12s	41½	26s	49 @50
14s	42	30s	53½ @54
16s	42½		

Single Warps.

8s	40	20s	44 @44½
10s	41½	26s	50½ @51
12s	42	30s	54 @54½
14s	42½	40s	60 @61

Carpet and Upholstery Yarn in Skeins.

8s and 9s ¾ slack	38 @39½
8 ¾ tinged tubes	37½
8 ¾ hard white warp-twist	38½ @39
8 ¾ hard twist waste	37½

Two-Ply Skeins.

8s	39	20s	44 @45
10s	41	24s	48
12s	41½	26s	51
14s	42	30s	54 @55
16s	43	40s	61 @62

Two-Ply Warps.

8s	40½	20s	45
10s	41½	24s	49 @50
12s	42½	26s	52 @53
14s	43½	30s	55
16s	44½	40s	62 @63

Frame Spun Carded Yarn on Cones.

8s	38½ @39	22s	43 @43½
10s	39 @39½	24s	44½ @45
12s	39½ @40	26s	46½ @47
14s	40 @40½	30s	48½ @50
16s	40½ @41	40s	59 @60
18s	42 @42½	30s double carded	51 @52
20s	42½ @43	30s tying-in	44 @45

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	58	50s	80
20s	60	60s	90
24s	62	70s	$1.00
30s	65 @68	80s	$1.20@$1.25
40s	72 @75		

Mule Spun Carded Yarn on Cones.

10s	44	20	49
12s	45	24s	51
14s	46	26s	53
16s	47	30s	57
18s	48	40s	67

Mule Spun Combed Peeler Yarn on Cones.

10s	52	22s	61
12s	53	26s	65
14s	54	28s	68
16s	56	30s	71
18s	57	36s	74
20s	58	38s	77

High Pressure Lubrication.

That proper lubrication of machinery is vitally linked up with successful operation and good running work was brought out at the recent spinning division meeting of the Southern Textile Association at Spartanburg. At a previous meeting, held by the carding division in Anniston, reference was made to the application of the high-pressure gun type of lubrication as used commonly on automobiles to textile machinery, with especial reference to the hollow brass bushings on pickers.

An adaptation of this system of lubrication has been made with the "Dot" high pressure lubricator, manufactured by the Carr Fastener Co., 31 Ames Street, Cambridge, Mass. Most mill men are familiar with the use of the "forced" or "pressure" system of lubrication used on automobiles, and reports are that experiments applying this system to the machinery of a cotton mill are satisfactory in assuring positive, easily accessible and convenient and safe lubrication. The "Dot" system, it is stated is designed so that it may be used for oil as well as grease. The "gun" is constructed with a solid hardened steel nozzle, and gives 3,000 pounds pressure to the square inch. The nipples are made of steel and have ball check valves with springs to prevent leakage.

"There Sir, is the ideal package for spring needle machines—'The Supercone'

THERE'S six and one-quarter pounds of yarn on that package against two and one-half pounds on a bottle bobbin and we are running our machines more than ten hours without renewing yarn supply.

"The quality is much better than we've ever made before and there's very much less waste.

"These paper cones cost us less than two cents each against a dollar and half that we paid for wooden bobbins.

"Supercones are decreasing cost and increasing production. I'm for them."

Operators like "Supercones"

They don't spend half as much time doffing as they did with bottle bobbins, and the half-pound paper cone is much easier to handle than three-pound wooden bobbins.

UNIVERSAL WINDING COMPANY

Providence. New York. Chicago. **BOSTON** Philadelphia. Charlotte. Utica.

Montreal and Hamilton, Canada

DEPOTS AND OFFICES AT MANCHESTER AND PARIS

An Appreciation

TAKING nothing for granted—trying, devising and trying again—breaking precedent every day—constantly attempting and accomplishing the "unheard of"—we doff our hats to our own factory organization.

All honor to them!

Their rigid adherence to a policy of constant improvement in "Torrington" needle making has resulted in the lowest "needle cost per dozen hose" in the history of the hosiery industry.

Not even a "Torrington-Excelsior" needle is "good" if it can be made better.

The TORRINGTON COMPANY
TORRINGTON CONN. U.S.A.

C. B. BARKER & CO., LTD.
140-144 W. 22nd STREET,
NEW YORK.

LOS FABRICANTES UNIDOS
964 CALLE BELGRANO
BUENOS AIRES

MANUFACTURERS SUPPLIES CO.,
CHERRY AND JUNIPER STS.,
PHILADELPHIA.

The Knit Goods Market

The slowing down on business in the knit goods primary market in the last two months was accompanied by no recession in manufacturers' prices. This seems likely to come later if production be not adjusted to lighter demand for distribution. Some of the hosiery mills are as busily engaged as anytime this year. Production has increased steadily since last December, as did shipments and orders until April. Meanwhile unfilled orders at the end of each month were becoming less, in volume of goods, and cancellations were slightly increasing.

Business in summer underwear, which was held in check by the backward spring, suffered little disturbance so far as mills were concerned, for those selling to jobbers had about completed the season. Trading in winter underwear, however, slackened materially, and there were indications that repeat orders would be slow in coming through. There also was a slipping back in wholesale operations in sweaters. The market was feeling the restraining influence of high prices, which, at the time business gave the first sign of falling off were tending higher.

There had been much speculation on the greater purchasing power, which, however, was not well distributed. The broadened buying power was, of course, the result in part of excessive wage disbursements in restricted quarters, and the higher wage carried prices up to what came to be regarded a dangerous level.

There are more dollars with which to buy goods, but it is a question whether they will buy goods. A sixteen pound union suit that for the recent winter cost the wearer $1.50, will, if present basic values continue, cost him $2 next winter. One good type of silk stocking which was priced regularly at $2 will cost the wearer 25 cents more, and the woman who has been paying $3 will pay $3.50. Not so many weeks ago 70 cents was the cost of 10 pounds of sugar. The same number of pounds now are costing the consumer $1. Such advances do not mean a great deal to the skilled mechanic receiving anywhere from $10 to $18 a day, who may ungrudgingly pay $50 for a suit of clothes which he has been buying at $45. But the major element of society will approach such increases in the cost of the necessities of life in a spirit of resistance. That distributors harbor the belief that such an attitude may be expected is reflected in their lessened buying for future and their operating with extreme caution in relation to nearby needs.

The drop in cotton was but an incident in the slackened pace in goods, the situation—the commodities market generally, slowing down on building operations and a mixture of March and April weather for May seriously affecting the business of retailers—were factors in an unusual combination of circumstances.

That cotton did radically decline necessarily left consumers of yarn uncertain whether it might not go to a still lower level. Whether the fear of a further sagging is well founded matters not to the owner of stocks of goods produced on the highest level of manufacturing cost since the early days of 1920. Wages of course had advanced with textile raw materials and finished products, and the seemingly abnormal prices of hosiery, underwear and sweaters have gone into distribution at prices above the basis of cotton at 25 to 26 cents a pound. Taking this view, finished goods in stock and on commitment should be regarded a safe asset, but as cotton took an unexpected drop it is difficult to convince any conservative manufacturer or merchant that it may not do so again. Considering there has been an average increase of 12½ per cent in textile mill wages, with demand for further increases cropping out in many quarters every working hour, there also is fear that inflation has not been halted and that if it proceeded much further the jolt from deflation will be more severe than it now would be.

Recalling the prime cause of stagnation of 1920—over production during a period of inflated prices—it would seem there should be avoidance of accumulations of hosiery stocks, nothwithstanding the prospect is that prices for fall and winter will not be under the present level. When prices were named last fall for the current season manufacturers owned yarns at comparatively low prices. Probably most of them will consume their yarn reserves in the completion of the orders on their books. Prices for later deliveries, it may be assumed, would have to be based on yarn bought on today's market, which is higher by approximately 15 per cent than last September.

Judging from the reports of volume business being taken by hosiery manufacturers selling to retailers, jobbers ought to be buying more freely of hosiery. It is estimated in the trade that jobbers as a class have yet to buy fully 50 per cent of their requirements for fall and winter, and it was stated on seemingly good authority that jobber purchases for the months that have gone by and those that must be promptly provided for have not measured up to what might have been reasonably expected.

It would appear a considerable number of distributors are overlooking the fact there are about 110,000,000 pairs of feet in the United States that must be shod and that 54,000,000 pairs of American made stockings are going to foreign countries this year.

Low end cotton hosiery of carded yarn went to higher price levels, relatively, than combed and mercerized, but was sold up well ahead by most mills making such lines. If yarn advances to near the recent peak it is not improbable the 15 cents a pair carded half hose will disappear from the counter. At prices which retailers recently were paying they probably could not sell the socks profitably under 19 cents. They should, however, enjoy an advantage from the fact that men's socks at 10 cents a pair are not likely to be found in the five-and-ten cent stores.

Combed half hose will continue for some time as a 25 cents a pair seller, and this may make it difficult to obtain 19 or 20 cents for carded. Then there is to be taken into consideration the quarter of a dollar mercerized sock with plain cotton top. In the general antagonism to high prices there should be a good sale for combed and low end mercerized half hose.

There existed a belief in some quarters that ladies mercerized hosiery was destined to be a quiet number for a while. Yet a mill making a featured line to retail at 50 cents a pair is having volume business. The commonplace mercerized for ladies seems to have been caught between low priced seamless silks and high grade combed goods. Sev-

ABERFOYLE MANUFACTURING COMPANY

MERCERIZED YARNS

MAIN OFFICE
EMPIRE BUILDING
PHILADELPHIA

ADAMS-FRANKLIN BUILDING
CHICAGO

MILLS
CHESTER, PA.

WESTAWAY BUILDING
HAMILTON, CANADA

DIXIE MERCERIZING CO.
STRENGTH QUALITY
LUSTRE
CHATTANOOGA TENN.

Mercerized Yarns

C. P. Mercerized Cones & Skeins
20/2-80/2 Natural and Gassed

DIXIE MERCERIZING CO.
CHATTANOOGA, TENN.

Chicago Office
817 Old Colony Life Insurance Building
CHICAGO, ILLINOIS

REPRESENTATIVES: Philadelphia, Pa., Cameron & Pfingst—Reading, Pa., Cameron & Pfingst—Canada, Slater & Co., Toronto.

It Magnifies the Power of Daylight

BRIGHTEN your factory with that mill white which wears longest—Wahcolite. Time cannot turn it yellow. Nor make it chip, crack or peel. Over a span of years Wahcolite costs you far less.

Wahcolite is the perfect white finish for walls and ceilings. It magnifies the power of daylight—distributes it more evenly, and further. For Wahcolite's refractive powers are proved by tests to be greater.

Booklet No. 12, "Keeping in the Spotlight," gives you complete information. Write for it to-day.

OUTSIDE—Bay State Brick and Cement Coating beautifies and waterproofs all buildings of brick, cement and stucco. The hardest rain cannot beat through a coating of Bay State. Write for booklet No. 12.

WADSWORTH, HOWLAND & CO., Inc.
BOSTON

"WAHCOLITE"

eral mills are having a big run on their five thread 240 and 260 needle chiffons, their prices being more than usually attractive, taking into consideration the high cost of raw silk.

The 50-cents-a-pair mercerized referred to is fashioned, although not knitted on flat machines. It is being handled exclusively by the Rockford Textile Sales Corporation and is shown in sports effect and in high colors, red, blue and green being bought conservatively by numbers of jobbers.

A line of half hose that is attracting much attention, and is in restricted output, is of fiber silk and mercerized yarn, with raised stripe, shown in all of the popular shades. Companion numbers are fiber plated on mercerized, in plain and in drop stitch.

Half hose of tram silk and artificial silk in combination have not been in as great demand as a few months ago, probably due to the bringing out of several striking innovations. There is a difference of precisely $1.10 a dozen between the prices of a northern and a southern mill making this combination of silk, and the lower priced line weighs but one ounce per dozen less than the higher priced. It is a question in the mind of a primary market distributor of the latter whether he can successfully compete with the lower priced sock, notwithstanding it appears to be of somewhat less stout fabric.

Few of the Philadelphia mills other than those selling to retailers direct show any enthusiasm over the business they are booking, this leaving out of consideration the comparatively few which are specializing in chiffons. As there is a feeling in the trade that 1923 is to be an unusually big silk hosiery year there is some question as to the outlook for ladies hosiery of silk and wool in combination for next winter. One of the leading New York houses, reports, however, that jobbers are buying freely of its silk and wool number put out as a $2 a pair seller.

It is understood jobbers are quoting $15 a dozen for goods taken in at once, one dollar more for late deliveries. Jobbers are buying so guardedly of higher priced numbers as to leave inference of a distrust in the prices of both the raw fiber and finished goods. Spinners of worsted yarn, probably all of whom have business on their books for a two months run, are booking very little new business, yet prices remain firm.

One of the big sellers in low priced goods is a women's cotton heather to retail at 50 cents a pair, and a dollar number also is being taken fairly freely. There seems no doubt that men's heathers will be fully as popular as last winter, and some mills are sold up of goods priced around $6.50 a dozen and up. Men's hosiery of silk and wool are promising of a wholesome outlet, and dealers, it now appears, will be safe in making liberal commitments.

Scattered reports obtained from manufacturers in a casual way indicate a very materially slackened consumption of silk, but that fiber refuses to be budged from its high market level, and trading in silk hosiery staples is lagging, yet several mills might be mentioned which had to shut down on selling high grade seamless for ladies because of a congested condition in dyehouses, where employees were indifferent and clamoring for wage increases.

Chiffons continue to be in good inquiry and buying is on a fair scale, but it was noted there was a slight falling off in the sales for a time, this being less pronounced than in silk staples. It is stated by several primary market operators that chiffons are a better seller in almost every other city than in Philadelphia.

Prices on ladies full fashioned silks have been far from uniform, quotations of several manufacturers varying by 50 to 75 cents a dozen for 11 thread. One mill was quoting a 10 thread for immediate delivery at a price which makes it possible for a retailer to sell profitably at slightly under $2 a pair.

Snellenburg's advertised at $1.25 a ladies silk stocking which regularly sells at $2. This was a branded stocking, well known in the trade, and it is stated the Snellenburg Company was fortunate enough to acquire a job lot at a very low figure.

While all reports indicate a quiet situation in ladies full fashioned silk stockings generally, it is understood the Berkshire Knitting Mills, whose lines were opened late in April for the last six months of the year, have booked contracts with a number of the Company's regular customers for from 10 to 20 per cent more than they bought in 1922 under initial orders for the last half of the year. The Berkshire is believed to have made a master stroke in advancing the price of its standard 11 thread stocking only 35 cents over last year's figures. As many retailers have been selling this stocking at $1.95, it is figured that by adding 5 cents a pair they will easily absorb all of the advance that jobbers will require of them.

Misses fine gauge ribs of combed yarn have been bought extensively by jobber and retailer, jobbers paying from $1.75 to $1.90 a dozen, these prices representing the somewhat recent advances. Mills making this class of goods have had such a volume of business that several found it necessary to increase their output. The sales, of at least one manufacturer, were 50 per cent greater to May than for the corresponding period of last year. Notwithstanding there were rumors of cancellation, distributors were clamoring for combed ribs and there was equal pressure for sports goods, commonly referred to as three-quarter length with fancy roll tops. These have had a brisk season and demand has not been fully supplied. This is due in part to an unsatisfactory labor situation in several mills making this class of goods.

Misses coarse gauge ribs, which were salable to jobbers at around $1.05 by a mill specializing in the better grades of this class of goods, necessarily are in lighter demand since the decline in cotton.

A New England mill reputed for its line of infants cashmere socks is sold well up for fall, while infants socks of mercerized and combed yarn are being sadly neglected for current distribution. Apparently there was over-production. It was common knowledge that jobbers had considerable carryover stocks from the preceding year. Although it is reported retailers have been buying freely, jobber repeat orders are few in number and for small quantity, which would seem to bear out the proposal that distributors began the season with some goods which had been bought for last year. The sock market was distributed immediately following the opening in 1922, when manufacturers engaged in severe price competition.

All things considered, the hosiery market situation probably is as good as it ought to be, certainly not as bad as some interests picture it. Unless there shall be serious dis-

turbance of economic conditions, the market should improve during the summer and enter upon a brisk fall.

A representative mill distributing through retailers sold 72 per cent more hosiery in April 1923 than in April 1922. A person speaking for this establishment says that in his opinion a majority of the direct to retailer mills have had substantial increases, from which he deduces there is good business being done in hosiery, and he cannot conceive there are grounds for complaint in any quarter.

Retailers, of course, suffered much discouragement in their spring business, particularly in April. A jobbing house executive recently made a tour of the industrial and mining regions of interior Pennsylvania, and says he found retailers almost everywhere virtually speaking in chorus when describing conditions with them. The dealers were in accord with the view that business had been retarded by almost uninterrupted cool weather. Unsatisfactory collections from retailers is regarded as confirming their reports of light sales, leaving the conclusion that there are goods in stock that should have gone over the counter.

Mill operation in mens popular priced light weight underwear continue top notch, and jobbers are complaining of slow deliveries. They have sold to the limit against their initial orders, apparently, and retailers are repeating. Except as to the completion of orders on their books, manufacturers have about reached the end of the present distribution season.

While some mills still are booking repeat orders for men's light weights, with mills in the Mohawk Valley being pushed for goods, there has been a material slowing down among the factories in the Schuylkill Valley section of Pennsylvania making ladies summer underwear. Numbers of these mills carried goods over from last season. Some of them are operating on reduced time and there is talk of not a few closing down for the summer months. These manufacturers are visibly more concerned over the opening for next season than the present situation. When they came on the market for the current season they owned yarn at something less than 42 cents for double carded thirties. Were they to figure now on prices for the season of 1924 they would have to reckon with yarn at about 50 to 52 cents. The best they could do would be to provide for an advance of eight cents a pound, and as ladies union suits of the types common among the mills referred to weigh about three pounds to the dozen, it may be assumed the garments would cost retailers fully 50 cents a dozen more than the prices they paid for current distribution. In practically all of the sub-standard lines for women, business with the Pennsylvania manufacturers is very unsatisfactory.

There has been considerable discussion as to when prices shall be named for next spring. It is the consensus in the trade that manufacturers generally will not come in the market before July, and in some quarters it is thought the opening might well be deferred until about the first week in September. Unless cotton becomes steady, it is expected jobbers will buy sweaters conservatively regardless of the prices manufacturers name, and it is feared that in that event there would be a repetition of the price competition of a few years ago. In favor of manufacturers when prices do come out will be the fact that there will be no left-over stock from the present season, as recent buying has been for only needs for a short time.

Business in underwear for next fall and winter fell off when prices were advanced some weeks ago, and necessarily has not improved since the cotton market became wobbly. In fact, very few jobbers were in the market last month for additional heavyweights. It became a question whether distributors might not use the cotton price decline as a club in an attempt to smash winter underwear prices. They have yet to buy probably 25 per cent of their normal requirements, which may be reduced if present prices be adhered to. Jobbers will fight to the last ditch in resisting further advances, particularly in view of the fact there has been some few cancellations from retailers. There was a slight increase in cancellations as the declines in the commodities market became more pronounced, and it was noted that the repudiation of some orders applied to branded lines in which there was no price competition among jobbers. It seems to be a foregone conclusion that the bulk of the repeat orders will come in very late, working a hardship on mills, some of which in the meantime will have completed their initial orders and will be in need of business. Except as to the help situation, conditions among manufacturers of heavyweight underwear for men have been very satisfactory, but there is some concern over the finish of the season.

It is understood that the Appalachian Mills Co. and the Standard Knitting Mills, both in Knoxville, Tenn., as well as several others, are sold up to October. These mills probably would not be able to obtain orders now at adequate prices for that and the succeeding month, and it is a question whether the cautious manufacturer would care to book business at this time for the late fall months. The two southern mills referred to were singularly fortunate in opening their lines early for next winter. A large part of their production was sold in a very short time, at graded prices, depending on delivery periods. Goods taken in early were moved out promptly by jobbers to retailers, so that the great bulk of the business of these southern mills is safely out of the way.

A pessimist among pessimists was a southern underwear manufacturer who attended the meeting of the Associated Knit Underwear Manufacturers of America in Atlantic City in May. Another manufacturer, from the same state, who also was present at the meeting was equally depressed. There was a far more cheerful feeling among the underwear mill executives of the North than that expressed by the two southerners. Both recognized they were going through in a thin market period, and manifestly were giving careful thought to reports of requests for deferred shipments. In the main, it cropped out, there was maintenance of heavy production, slackened demand and available supplies of goods being augmented.

It was held, however, that industrial activity, which in great measure seems likely to be sustained throughout the fall, enocurages the view that the resumption of buying will be on a fairly extensive scale and that the lull which began in April and became more general in May will be of short duration.

Some light was thrown on distributor attitude toward prices and the next opening in replies to questions submitted by the National Wholesale Drygoods Association to members of the Jobbers Association of Knit Goods Buyers. On the question as to the earliest date when manufacturers

could show spring lines, it was the consensus, "Probably not before July 1 or as favorable opportunity presents itself, so that wholesalers may put their lines on the road early in September."

The knit goods buyers also were asked, "Do you believe retailers would buy underwear and hosiery at prices based on today's cotton, for spring of 1924?" Almost as though speaking in unison, the buyers answered "No." They gave the same reply to the question, "Do you feel it safe to sell short on fall underwear with selling prices based on mills' opening prices?" and chorused another "No," in reply to the question "Do you think retailers would buy your lines at advanced prices based on today's cotton market?"

Asked whether they felt it would be safe to sell short of fall underwear, with selling prices based on mills' present prices, practically all replied "Yes."

Little activity is noted in the market for sweaters. Jobbers seem to have bought fairly well ahead for their fall requirements, and current spring business with them is a matter of the past. Worsted yarns have advanced since manufacturers named their prices for fall, and the strength of the wool market lends no encouragement to the hope that yarns will decline. While manufacturers are waiting for duplicate business, which probably will be placed very late; it is believed they will be reluctant to take on yarns, although it is noted several have taken samples, with options at a price which figures up to about the peak for worsted yarns this year.

Notwithstanding sweaters for fall are not being bought except in a very guarded way, some mills are knitting samples for next spring, and prices may be named by a few before July—earlier if buyers be found in a receptive mood. mood.

American Cotton Manufacturers' Association Convenes at Richmond.

(*Continued from page* 642)

In connection with Mr. Jones' comment on the Fulmer Act, Mr. Meadows explained that the purpose of the bill was for the establishment of a universal standard by which the American shipper and merchant could arbitrate. He pointed out that such a standard had been recommended as ideal at the cotton conference in Atlanta in 1907, endorsed at the New Orleans conference in 1919, and again at Liverpool in 1921, but that the English had failed to put it in force. The whole intention, he said, was to establish a standard that would be universal, "so that the American would not have to arbitrate against a standard established whenever three or four Englishmen get together."

The report of the resolutions committee, made by James D. Hammett, chairman, was next heard. The resolutions adopted included one protesting against "the relatively high prices charged for textile machinery, and machinery repair parts" and urging machinery builders to "promptly locate depots at central stations in the South in order that time may be saved in obtaining needed supplies and freight charges may be reduced because of carload shipments from the shops to the points of distribution."

Resolutions of condolence were passed by rising vote in memory of the following members of the Association whose deaths occurred during the year following the previous meeting: Clarence B. Bryant, J. J. Bradley, J. D. Comer, J. Locke Erwin, C. B. Henry, T. C. Thompson, W. J. Kincaid, F. L. Baily, M. P. Glynn, J. W. Dorsey, E. C. Klipstein, Horace S. Sears, A. A. Jenckes, and George A. Draper.

Another resolution petitioning Congress to make such appropriations in solving the boll weevil problem as will enable the Department of Agriculture and the other agencies of the government to proceed on more vigorous and comprehensive lines was passed.

The next order of business was the report of the nominations committee and the election of officers. The committee report was made by William D. Anderson of Macon, Ga., chairman, and the results of the election were as follows:

President, W. E. Beattie of Greenville, S. C.

Vice-President, A. W. McLellan of New Orleans, La.

Chairman, Board of Governors, W. J. Vereen of Moultrie, Ga.

Secretary-Treasurer, Winston D. Adams of Charlotte, N. C.

The following elections to the board of governors were made to fill expiring terms: Scott Roberts, of Anniston, Ala., succeeding Donald Comer, of Birmingham, Ala.; P. E. Glenn, of Atlanta, Ga., succeeding J. D. Massey, of Columbus, Ga.; J. P. Gossett, of Williamston, S. C., succeeding Augustus W. Smith, of Greenville, S. C.; and Samuel F. Patterson, of Roanoke Rapids, N. C., to succeed himself, Mr. Patterson having been elected last year to serve out the unexpired term of T. C. Leak, of Rockingham, N. C. Captain Ellison A. Smyth was elected to succeed himself as a member of the National Council of American Cotton Manufacturers. Stuart W. Cramer was named to continue as chairman of the national committee.

General Lawrence D. Tyson and Thomas H. Rennie were named as a committee to escort the new president to the platform, where the retiring president presented him with the gavel of the Association.

Joseph H. Separk of Gastonia, N. C., in a happy presentation speech, presented the president's medal to Retiring President Hutchison, following which the convention was officially adjourned.

Finishing Cotton Bag Goods.

(*Continued from page 703.*)

put in the shear in front of the metal doctor and scraped the starch while the metal doctor served to stiffen it.

Starching.

While wheat flour is perhaps the best of all the substances for giving an adhesive property to size for filling bag goods, there are so many objectionable features involved in its use that it is not being used now as much as it was in the early days of cotton finishing, and so we will pass it by.

Corn starch is used chiefly now-a-days for heavily sized goods, but it requires a thorough boiling in order to thoroughly gelatinize it and unless this boiling is prolonged for at least one hour the size will give the goods a rough harsh feel. Corn starch must be thoroughly cooked before applying it to the goods, otherwise it is possible to detect, by means of the microscope, unbroken granules of the starch in the size which has been washed from cloth containing it.

Caustic alkalis have a peculiar action on starch. If starch be boiled with water containing only one half of one per cent of caustic soda (i. e., ½ pound of soda to 100 pounds of starch) a paste is formed which is much thicker and very much more adhesive than if boiled with water alone. Moreover, goods sized with it are smoother and softer and in the case of corn starch it removes all harshness and brittleness from the feel of the finished goods and in fact enables the corn starch to take the place of the best flour so far as making size for the Tommy Dodd or back-filling machine is concerned. The Scotch mangle is a different story and needs different size, perhaps. The reader will understand from this, then, that in all cases where corn starch is used for this class of work it is advisable to add from one half to one per cent of solid caustic soda (or its equivalent of liquid) to the water and *thoroughly mix* before adding the starch.

Some of the chief advantages to be gained by thoroughly boiling a mixing and completely gelatinizing the starch granules are as follows: In the first place the starch is divided into minute particles in which state it can be intimately mixed with the other ingredients of the size. In the second place, starch which has become completely gelatinized prevents, to a great extent, the China clay from settling out. It also assists in keeping the tallow or other softener in suspension, and there is not the same tendency for these substances to separate out and float on the surface when the "mixing" cools. Conditions such as the foregoing all make for uniformity in the results obtained in sizing.

I may as well point out at this stage that both sago and corn starches require not only a simple boiling, but the operation must be prolonged sufficiently to cook them, otherwise the best results cannot be obtained.

China clay should be boiled from one to six hours before using, not merely to break up all the lumps and disintegrate all particles from each other, but the boiling seems to make it smoother and it goes on the goods better.

China clay should be boiled in a tank with as little water as it will work in; this tank or tub should be set high up from the floor so that the mixing tub is below the bottom of it and the dough mixer or boiler below that again the idea being to run the clay into the mixing tub, the mixing out of this again into the boiler and the boiled size into the finished bins where at least one week's supply should be kept ahead.

The clay tub consists of a large wooden tub fitted with a rotating agitator and a steam pipe for boiling the clay—and this should be a straight pipe, not a coil. After boiling, the clay should then be run through an opening in the bottom of the tub through a sieve into the stock tub. A slight calculation will tell the starcher how many pounds of *dry* clay there are in each gallon of this mixture, and he can make his mixings accordingly. From this stock tub the clay is passed through a still finer sieve into the mixing tub, to be mixed with the starch and other materials and from this into the dough mixer to be boiled one hour. Where no dough mixer is available the mixing is boiled in the mixing tub.

I might say here that the mesh of the fine sieve should be 80 x 100 and of the coarse sieve 60 x 60, made from bronze wire 9/1000.

A dough mixer, to boil the starch in, being all enclosed, never splashes over. It needs no attention to speak of; the mixture is run into it, the worm is started, and the steam is turned on and when the boiling is completed the cover is opened and the size run or shoveled out into a bin or tub to be cooled off ready for use in the starch mangle box. I would say here that all heavy sizings made from starch and China clay run better in the starching machines—be they either Tommy Dodds or back-filling machines—and fill the goods better, when used cold, or comparatively cold, than they do when used hot. Therefore, all mixings should be made some time ahead and cooled off.

All mixings for the backfilling machine containing clay or mineral should be made thicker than required and then thinned down with cold water. The same heavy size made for the Tommy Dodd is about right, when thinned down, for the backfiller. In the case of very low open goods it pays to run them twice in thinner size than attempt to fill them at one run in an abnormally thick filling.

It is not possible here to give any arbitrary recipe for a standard mixing for bag goods as much as depends on local conditions, therefore the starcher must use his judgment and experiment a little. I will however give one or two that have worked well elsewhere:

1, 81 pounds China clay (well boiled)
45 pounds corn starch
3 gallons soap liquor
45 gallons water
½ pound caustic soda previously dissolved.

Dissolve the caustic in the water first and mix thoroughly, then add the starch and mix well for 15 minutes to thoroughly separate all the grains, then add, through a fine sieve, the well boiled clay, then the soap and blue to shade—boil one hour. The soap is made by boiling hard tallow soap in water and dissolving it so that each gallon contains about two pounds of soap.

2. 120 pounds corn starch
90 pounds China clay
3 quarts soluble oil (50 per cent)
15 pounds tallow or hydrogenated menhaden oil
100 gallons water.
Blue to shade.

3. 135 pounds corn starch
75 pounds sago starch
175 pounds China clay
10 pounds soap (previously dissolved)
10 pounds tallow
200 gallons water.
Blue to shade.

All of the foregoing must be boiled at least one hour, and, it is of the opinion of the writer that the addition of one per cent of caustic soda to the water before entering the starch will be of advantage.

I would warn the starcher that the consistency of a mixing is much influenced by the length of time that it is boiled, and the starcher who wishes to keep his mixings uniform will be particular to always boil his mixings the same length of time. I might say here that many English starchers who make a specialty of bag and similar goods advocate the boiling of the starch first until thin and then adding the clay and other materials in a comparatively cold condition, which reduces the temperature of the whole mixture to about 150 degrees F., and then mechanically stirring the whole mass, without further boiling, until it is thoroughly smooth and homogeneous, and this idea looks good to the writer for all sizes to be used on a Tommy Dodd or a back-filling machine.

Sandoz
ANILINE DYES for ALL TRADES
SANDOZ

We carry a complete line at all branches.

For samples and prices apply at any of our offices

SANDOZ CHEMICAL WORKS
INCORPORATED
238-240 Water St. NEW YORK
12 South Front St., PHILADELPHIA
36 Purchase St., BOSTON
126 Market St., PATERSON
145 Brevard Court, CHARLOTTE, N. C.

5 Painters' Work—1 Man Cost

CONSIDER your saving in labor cost alone when 1 DeVilbiss spray operator does the work of 4 to 5 hand brushers. That is the average economy effected in painting your mill interior, its outside walls and the village homes with the

DeVilbiss
Spray-painting System

Additional advantages are: a more thorough and uniform coating; a coating with the hiding power of two brushed coats; less scaffolding; no costly replacing of brushes; cleaner work and less interference with mill operation.

Investigate this modern, low cost DeVilbiss way of painting--details gladly mailed

The DeVilbiss Mfg. Co., 258 Phillips Ave. Toledo, Ohio

AUTO GYP
Process of Dyeing

Apace With the Times

ARE you apace with present day methods of dyeing and bleaching—or do you still rely on the old method of dyeing and bleaching separately?

The AUTOGYP Process of Dyeing is the most modern method known.

It does the work of bleaching and dyeing in one operation, to the exact desired shade, eliminates specks, motes, leaf and shives.

It renders much better results and saves from 4 to 17 hours time—eliminates 6 separate operations—reduces 3½% of shrinkage—saves 50% of steam—30% of labor and ALL THE CHEMICALS used in the old chloride of Lime method of bleaching.

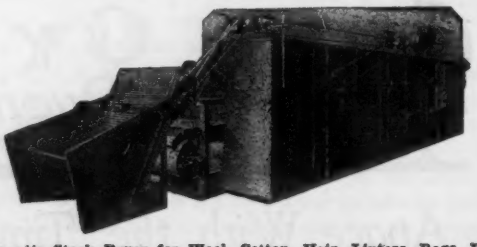
There is no need of wasting time and materials bleaching your goods.

The AUTOGYP Process requires no special skill, no special apparatus and saves boiling out in kiers or other appliances.

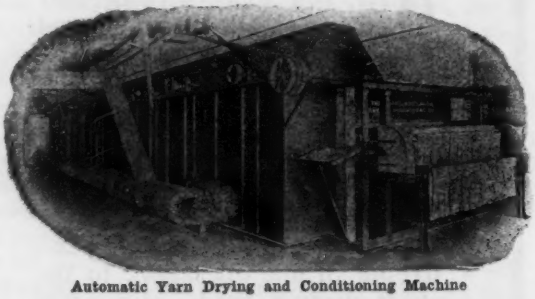
Let us explain to you the many more features of AUTOGYP that will make your dyeing a profit to you. Our representative will be glad to call, or write us for full information. AUTOGYP merits your careful consideration.

Surpass Chemical Co.
Albany, N. Y.

Dyes and Bleaches — AUTOGYP — **In One Operation**



Automatic Stock Dryer for Wool, Cotton, Hair, Linters, Rags, With Patented Spirally Woven Sectional Wire Cloth Conveying Apron



Automatic Yarn Drying and Conditioning Machine

For Cotton, Woolen, Worsted, Silk, Linen or Jute Yarns

"HURRICANE" DRYERS

The "Hurricane" Line of Drying Machinery Includes

Automatic Loop Dryers
For Underwear, Toweling, Piece Goods, Silks, Plushes, etc.

Continuous Piece Carbonizing Machines

Automatic Yarn Dryers
For Cotton, Worsted, Jute, Silk and Artificial Silk Yarns

Truck Dryers for Yarn
Tape, Braid, etc.

Automatic Raw Stock Dryers
Single and Multiple Apron Types for Wool, Cotton, Linters, Hair, Flax, etc.

Automatic Raw Stock Carbonizing Machines

Automatic Yarn Drying and Conditioning Machines for all kinds of Yarn.

Truck Dryers for Yarn
Dyed on Cones.

Hosiery Dryers
Dyeing Machines

A "Hurricane" Dryer for Every Material

Complete Equipments for

Bleaching, Dyeing and Drying

Send for illustrated Catalogs.

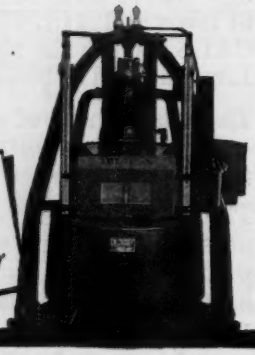
The Philadelphia Drying Machinery Company

Main Office and Works
Stokley Street above Westmoreland

Philadelphia, Pa.

H. MORSHEAD, Sou. Rep.

Boston Agency
53 State Street



All but Human—*the operator has only to load; then unload*—

when the HUMATIC signals to do so. The extracting is always done thoroughly, accurately, in a way that produces uniform results. This is one of the features that has put the HUMATIC in a place by itself. Write today for full information.

The American Laundry Machinery Co.
Specialty Dept. C, Cincinnati, Ohio

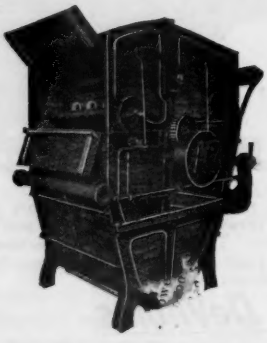
The Canadian Laundry Machinery Co., Ltd., Toronto, Canada.
American Laundry Machinery Co., Ltd., London, England

Automatic Safe!

STANDARDIZE

on

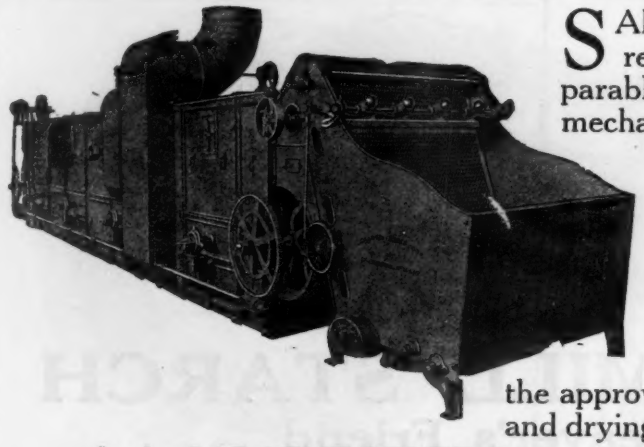
RODNEY HUNT WASHERS



(Ask for Booklet 221)

Cotton Fabrics, Woven or Knitted

Rodney Hunt Machine Co.
47 Mill St. Orange, Mass.



SARGENT DRYERS mark progress in Dryer Development comparable to that made in other fields of mechanical endeavor.

They are favored with a natural preference because they are designed on basic principles of air circulation, conveying and general drying apparatus construction which have had the approval of discriminating mill men and drying engineers for many years.

In the SARGENT DRYER these principles have been combined and refined, making a complete machine which is unexcelled.

For drying cotton, linters, wool, hair, flax and other classes of raw material.

C. G. SARGENT'S SONS CORPORATION, GRANITEVILLE, MASS.

Fred H. White, Southern Agent, Greenville, S. C.
R. C. Jefferson, Phila. Agt., Drexel Bldg., Philadelphia, Pa.

SARGENT DRYERS

Sulphurous Acid Generator

Assures A Uniform, Neutral Product

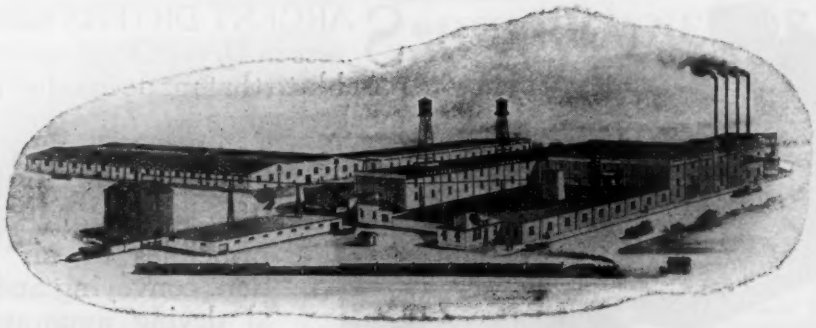
THE SULPHUROUS METHOD is not only more economical as an anti-chlor, but eliminates all danger of goods being tendered on dryer and assures a uniform, neutral product. No other anti-chlorine method can produce as soft, white or brighter bleach.

You can make your own anti-chlor in the form of sulphurous acid, in your own bleach house only in quantities to meet your immediate demands. The Monaghan Sulphurous Acid Generator manufactures it at a much lower cost than you can secure it elsewhere. It ...es two washings and effects a great saving in p... r, labor and loss of time, and allows washers to ... uce more.

Can be instal... o deliver to souring machine or storage ...nk.
Constructed wholly of lead, and guaranteed gas-tight.
Occupies only 36 sq. ft. floor space and requires only 2 h.p for operation.

Let us send you detailed information.

MACOMB Machine Co.
230 Newton St., Waltham, Mass.



VICTOR MILL STARCH

The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

DURABLE K-W UNIVERSALLY USED

KLAUDER - WELDON DYEING - BLEACHING- SCOURING MACHINERY

There are K-W machines in use which were built nearly half a century ago and which are still doing their work efficiently and economically under severe service. This is sufficient evidence of the durability and capability of K-W machines after long years of subjection to the ravages of live steam, heat and alkalis.

K-W Machinery, by its accomplishments, has steadily and irresistibly built up a reputation that has made the name "Klauder-Weldon" synonymous with the "world's best dyeing, bleaching and finishing machinery."

Our interest in upholding the K-W reputation means that you MUST be satisfied, and our suggestions to prospective purchasers are made with the view toward solving any dyeing, bleaching or scouring problem for all time. We will be glad to answer any and all questions without obligation on your part whatsoever.

Write today for K-W Literature

THE KLAUDER-WELDON DYEING MACHINE CO.

Bethayres, Pa., U. S. A.

H. G. Mayer, Southern Agent,
Realty Bldg., Charlotte, N. C.

FILTERS

PRESSURE GRAVITY

Especially designed to meet all requirements of Textile Mills.

Economical in upkeep.

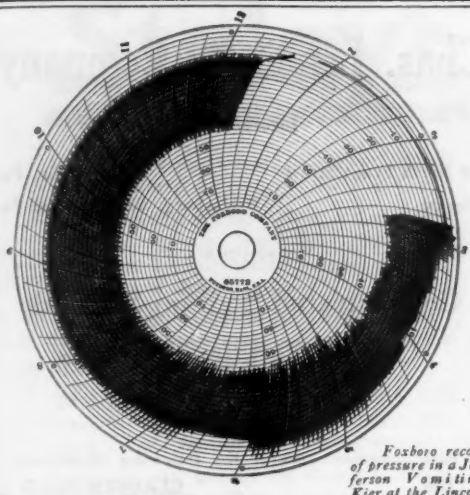
Perfect satisfaction.

NORWOOD ENGINEERING CO.

Florence Mass., U. S. A.

CHAS. M. SETZER, Southern Representative,

Charlotte, N. C.



Foxboro record of pressure in a Jefferson Vomiting Kier at the Lincoln Bleachery, Lonsdale, R. I.

Up and Down 16,000 Times a Month

The Foxboro Helical Tube Movement

The unretouched photographs reproduced above show a Foxboro Helical Tube taken from stock. Note the uniformity of every convolution—striking proof of the superiority of the Foxboro method of drawing in the temper.

Foxboro Helical Tubes do not fatigue, split or leak. They are permanent in calibration and may be used constantly at maximum range without affecting their accuracy or strength.

The wonderful dependability of these tubes means much to users of Foxboro Recording Gauges, Thermometers and Psychrometers.

What more exacting test could be made of the strength and elasticity of the Foxboro Helical Tube Movement than recording the pressure changes in this type of Bleaching Kier? Pressure in the kiers is regulated by automatic controlling devices which raise and lower the pressure once every two minutes. The Foxboro chart record shown above was taken from one of several Foxboro Recording Gauges installed on Jefferson Vomiting Kiers at the Lincoln Bleachery, Lonsdale, R. I.

Up and down, 16,000 times a month, the pen arms of these gauges have accurately recorded the pressure changes for many months.

These gauges are identical in construction with the thousands of Foxboro Recorders that are performing less spectacular but no less dependable service in textile mills the world over.

Every Foxboro Recorder is built and fully tested to be fully worthy of its responsibility as 'The Compass of Industry." no matter how severe the service it is called upon to give. For full information write for Bulletin AS98-2.

THE FOXBORO CO., Inc.

FOXBORO, MASS., U. S. A.

New York Chicago Boston Tulsa Cleveland
Pittsburgh Philadelphia San Francisco
Rochester Birmingham

FOXBORO

REG. U.S. PAT. OFF.

THE COMPASS OF INDUSTRY

5301

An Airplane View

The Home of Douglas Starch Cedar Rapids, Iowa

Douglas Textile Starches

Backed by twenty years of successful use

Back in 1903 The Douglas Company of Cedar Rapids, Iowa, first produced Douglas Starches.

During the years following they built up a large domestic and foreign trade on Douglas Starch—and a reputation for making the highest quality and most uniform starch on the market.

Three years ago Penick & Ford, Ltd., purchased the Douglas plant and rebuilt it, putting in all the most modern improvements. It is now being operated by the same efficient organization as was formerly employed by The Douglas Company.

We now offer Douglas Starch in the following grades:

DOUGLAS CROWN STARCH
(a refined thin boiling starch)
DOUGLAS PEARL STARCH
DOUGLAS POWDERED STARCH
DOUGLAS WARP SIZING STARCH
DOUGLAS LION MILL STARCH

Our representative will promptly supply samples and full information. Write to

PENICK & FORD, Ltd, Inc.

Manufacturers of Corn Products

CEDAR RAPIDS, IOWA

or to any of the following offices:

New Orleans, La.	*Southern Representative*	*N. E. Representative*
Montgomery, Ala.	G. L. Morrison	Marble-Nye & Co.
New York, N. Y.	Greenville, S. C.	Boston and Worcester Mass.

Rohm & Haas Company Inc.

Manufacturers of

CHEMICALS

PHILADELPHIA, PA. BRISTOL, PA.

SODIUM HYDROSULPHITE—
Sulphoxylates and Allied Products.

LYKOPON—Sodium Hydrosulphite—
For reducing Indigo and vat dyes. Of highest quality and absolutely standard.

FORMOPON—For discharging.

FORMOPON EXTRA—For stripping.

PROTOLIN—For stripping.

INDOPON W—Indigo Discharge Assistant.

TARTAR EMETIC—Technical.

Represented by

The MAKENWORTH COMPANY
Greensboro, North Carolina

Chas. Lennig & Company

Incorporated

40 North Front Street Philadelphia, Pa.
Works: Bridesburg, Philadelphia, Pa.

Manufacturers of

Concentrated Sodium Sulphide
Crystal Sodium Sulphide

Also manufacturers of the following chemicals:

ALUM	GLAUBER SALT
SULPHATE OF ALUMINA—	OIL OF VITRIOL
Iron Free	NITRIC ACID
PAPER MAKERS' ALUM	MURIATIC ACID
WATER FILTRATION ALUM	NITRATE OF LEAD

Represented by

The MAKENWORTH COMPANY
Greensboro, North Carolina

Tycos
temperature
instruments
INDICATING
RECORDING
CONTROLLING
Scouring
In the scouring of cotton goods the strength of the acid is important and can be obtained by the use of accurate Tycos Hydrometers with the Twaddle Scale. Tycos Hydrometers meet every industrial requirement. Each is of the usual Tycos Quality and is certified.
Write for General Industrial Catalog showing complete Tycos Temperature Instruments for the textile industry.
Taylor Instrument Companies
ROCHESTER N.Y. 858
There's a Tycos or Taylor Temperature Instrument for Every Purpose

Uniform in Application

VICTROLYN

Penetrating, Lubricating, Dependable Assistant in Warp Sizing

KLORASENE

will remove Oil Stains.

If you are troubled, write us.

BOSSON & LANE
Manufacturing Chemists
ATLANTIC, . MASS.

Staley's

Staley's Starches are made to your specific requirements.

Each formula is based on exact, scientific analysis of your individual production problems, by our technical and chemical engineering staff.

Equally advanced manufacturing facilities assure the precise maintenance of original quality in each shipment.

That is why Staley Starches hold first place throughout the textile industry; why their record for results is unsurpassed.

You, too, can benefit by Staley methods. Our consulting staff is at your service.

A. E. STALEY MFG. CO.
DECATUR, ILLINOIS

508 Andrews Law Bldg. Spartanburg, S. C.
J. O. Pope Ansley Hotel Atlanta, Ga.
25 Church St. New York City
88 Broad St. Boston, Mass.

Starch

"BRETON" MINEROL "F"

For Cotton Raw Stock

"It Prevents Harshness"

BORNE, SCRYMSER CO.
Established 1874
17 Battery Place, NEW YORK
BOSTON **PHILADELPHIA**
Works: Elizabethport, N. J.

The Grasselli CHEMICAL CO.
GRASSELLI CHEMICALS DIVISION
EXPLOSIVES DYESTUFFS
Dyestuff Dept. 117 Hudson St. New York, N.Y.

Factories at
Rensselaer, N. Y.
Grasselli, N. J.

Branch Offices
Boston Providence
Philadelphia Chicago
Charlotte New Orleans
San Francisco

Sole Selling Agents for
ESSEX ANILINE WORKS, INC.
Boston, Mass.

KATIGEN DEEP BLACK GGN CONC

The Ideal Sulphur Black for Hosiery.

The Grasselli line of sulphur colors offers a wide range of products suitable for raw stock, machine or piece dyeing.

Through the use of these colors practically all shades possible of production by the sulphur group may be obtained.

We also offer a full line of Algol and Developed Colors manufactured by

FARBENFABRIKEN VORM. FRIEDR. BAYER & CO.
Leverkusen

Shades matched and quotations furnished promptly

Established 1815

ARNOLD, HOFFMAN & CO., Inc.

Providence New York Boston Philadelphia Charlotte

Oldest in Years. Youngest in Spirit
Modern in Ideas. Progressive in Methods
"Service" Our Motto

All kinds of
Warp Dressings, Finishing Materials, Soaps,
Soluble Oils, Etc.

Please Submit Your Problems to Us

"ARTCO" SILK OIL

for

***use on* Artificial Silk**

Hosiery and Sweater Knitters find "ARTCO" Silk Oil to be the best product for this purpose.

Prevents waste and saves time

Softens the Thread and lays the Fibre, and produces a Fine Lustre.

Samples and full information on request.

Manufactured only
by

QUAKER CITY CHEMICAL COMPANY
Broad and Lehigh Ave.
Philadelphia

A BIG CLAIM

To add salableness to your product without increasing the cost of production is a big claim to make, but not more than can be readily proved by the use of the special purpose alkalies

Wyandotte Textile Soda
Wyandotte Concentrated Ash
Wyandotte Kier Boiling Special

When you turn the camera and microscope upon the fabrics treated with these alkalies, the splendid condition of the fibre indicates the reason for the better appearance, softer feel and richer colors.

Should not your business judgment persuade you to benefit from these profitable factors?

Ask your supply man.

The J. B. FORD CO., Sole Mnfrs.
WYANDOTTE, MICHIGAN

NORTH

Going South? Where?

Labor—Power—Fuel—Taxes—Transportation—Climate—Raw Products—Markets and Capital are the vital Elements of Manufacturing and Industry.

The South Offers Steadily Increasing Advantages to All Lines of Textile Industry. Write for Information.

"To Develop and Utilize the Vast Natural Resources of the South Will Enrich the Entire Nation."

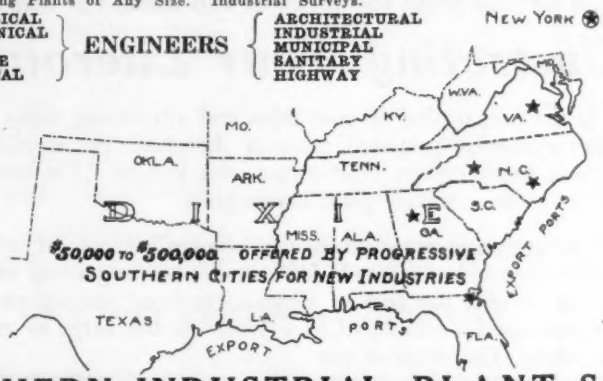
Our Staff of Engineers are at Your Service in Selecting the Site—Designing—Erecting and Equipping Plants of Any Size. Industrial Surveys.

ELECTRICAL
MECHANICAL
CIVIL
TEXTILE
CHEMICAL
} ENGINEERS {
ARCHITECTURAL
INDUSTRIAL
MUNICIPAL
SANITARY
HIGHWAY

WEST

District Engineers

Atlanta, Ga.
Charlotte, N. C.
Jacksonville, Fla.
Petersburg, Fla.
Wilmington, N. C.



EAST

Industrial Plants
Power Plants
Industrial Research
Municipal Engineering
Underground Electric Systems
Finance

SOUTHERN INDUSTRIAL PLANT SITES

AMERICAN INDUSTRIES ENGINEERING CO., 5 Beekman Street, NEW YORK CITY

Southern Office
CAROLINA ENGINEERING CO.
WILMINGTON, N. C.

★ DISTRICT OFFICES

SOUTH

Largest Builders

of Textile Machinery in the SOUTH

COCKER MACHINE & FOUNDRY COMPANY

GASTONIA, NORTH CAROLINA

Specialists in Designing and Manufacturing Machinery for Making and Handling of Warps

DESIGNERS AND BUILDERS OF

Warping Machinery: Linking Warpers—Balling Warpers—Beaming Warpers.

Warp Dyeing Machinery: Boiling Boxes—Continuous Systems—Sizing Machines—Indigo Vats—Warp Coilers—Dye House Ballers—Wash Boxes—Sulphur Vats—Scotch Systems.

Warp Beaming Machinery: Long Chain Beamers—Short Chain Beamers—Warp Splitters.

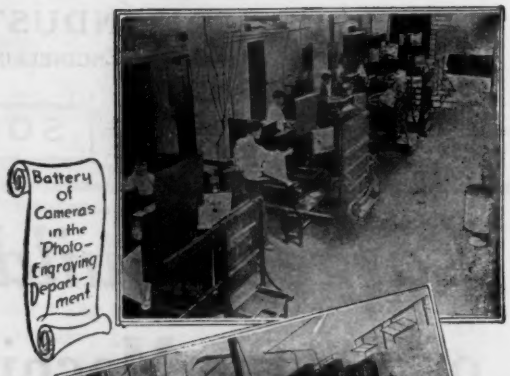
If It's A Broadside—

If it is an especially large illustration for an especially large piece of literature, chart, birds eye view, map, etc. Whether it be in one or more colors, our plant is equipped to supply your needs. No halftone or line plate too large or too small for our equipment.

Illustrating Your Literature

Sometimes in the preparation of your sales and advertising plans you find the need of some especially prepared piece of literature, the execution of which will baffle your photographer, electrotyper and printer. Frequently you may seek a service that the ordinary plant cannot give.

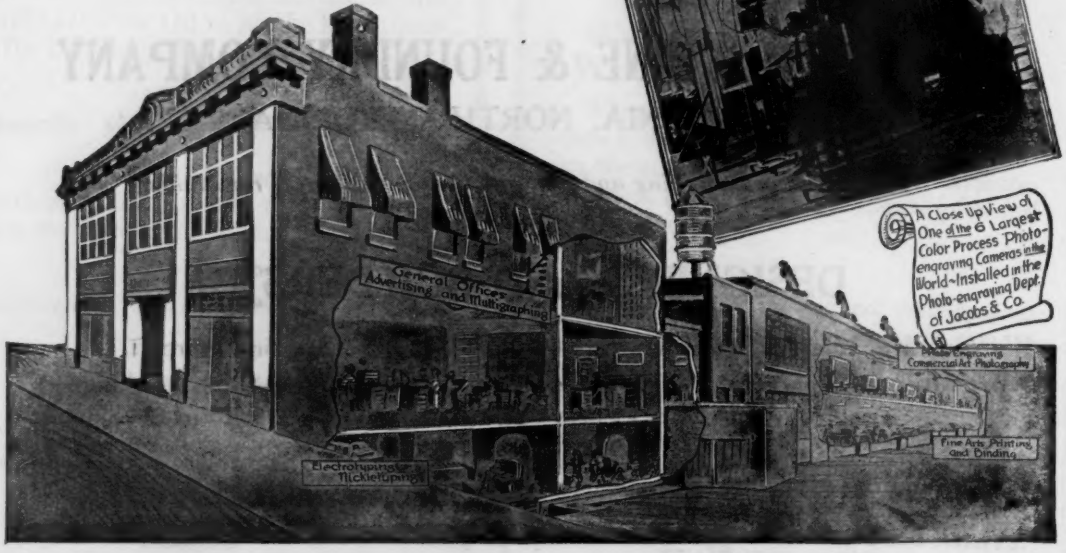
Our plant is designed and equipped for the accomplishment of many difficult products that cannot be secured from most photo-engraving establishments; is equipped to furnish the best of photo-engraving, electrotyping, printing, nickeltyping, commercial art and allied service, whether large or small, whether one or more colors. The extent of our equipment is reflected in the large process camera which can furnish you with process color plates as large as a yard square. One of the 6 largest in the world. If you have an idea you wish carried into execution, we are at your service. We will gladly perfect it and illustrate it.



A Close Up View of One of the 6 Largest Color Process Photo-engraving Cameras in the World—Installed in the Photo-engraving Dept. of Jacobs & Co.

Jacobs & Company
Clinton, S. C.

Advertising, Commercial Art
Photo-Engraving—Electrotyping
Nickeltyping
Color Printing


General Offices Advertising and Multigraphing
Electrotyping & Nickeltyping
Commercial Art Photography
Fine Arts Printing and Binding

Demanded By The Majority

Philadelphia Roller, Clearer and Slasher Cloths are **demanded** by America's foremost textile mills.

Roller Cloths—Our Roller Cloths are made of the right material with exactly the correct cushion and uniformity of surface to produce the most desirable results.

Clearer Cloths—Clearer Cloth is constructed of high grade material with thick, strong nap that does not pull out and its uniform length is such that the rolls are completely cleared of all short fibre.

Slasher Cloths—Our Slasher Cloth is made of the best material of sufficient cushion and porous to thoroughly force the sizing into the yarn.

Let us send you a trial order to convince you.

PHILADELPHIA FELT COMPANY

FRANKFORD, PHILADELPHIA, PA.

Southern Sales Agent: M. C. Sanders, Greenville, S. C.

FOR that silky, soft "kid glovey" finish on fine shirtings, sheer nainsooks, dainty organdies, and voiles, on high grade ginghams and sateens, use

CREAM SOFTENER J. B.

White goods stay white and even the most delicate shades are not affected by this creamy, white softener.

A finish cannot always be judged satisfactory immediately after it is applied. Father Time, the most critical judge, often makes an adverse decision after the goods have been on the shelf a few months.

Our Cream Softener J. B. is especially adjusted and standardized to cope with atmospheric, storage and other conditions to which material is subjected after finishing.

We guarantee this softener will not cause any regrets. The first and last decision will be favorable.

Allow us to send samples.
The product will prove itself.

JACQUES WOLF & CO.
PASSAIC, N. J.

Southern Cotton Mills
Appreciate thoroughly the
Value and Necessity
Of SAVOGRAN for
General Cleaning
Results Convince
Ask your Supply House
NOW!

Manufactured by

INDIA ALKALI WORKS
Boston, Mass.

Howard Bros. Mfg. Co.

ESTABLISHED 1866

HOME OFFICE AND FACTORY, WORCESTER, MASS.

Southern Branch Factory, 121 South Forsyth St., Atlanta, Ga.

Cylinder and Doffer Fillets

Stripper and Burnisher Fillets

TOP FLATS RECOVERED AND PROMPTLY RETURNED.
TEMPERED STEEL TWIN AND DOMESTIC IRON WIRE HEDDLES.
THE BEST MATERIALS OBTAINABLE MAKE UP OUR PRODUCTS.

Southern Agent
E. M. TERRYBERRY,
1126 Healey Bldg.,
Atlanta, Ga.

Asst. Southern Agent
G. L. MELCHOR,
121 So. Forsyth St.,
Atlanta, Ga.

Industrial Lighting

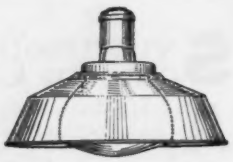
We are rendering textile mills all over the Southeast prompt and efficient service, supplying not only the most efficient and effective systems of illumination particularly suited to every textile mill use, but any type of Edison Mazda Lamp desired.

Whatever your electrical requirement, be it illuminating units, lamps, motors, wiring or what not, you will find Carter Electric Service more satisfactory and prompt.

CARTER ELECTRIC CO.

Distributors

ATLANTA SAVANNAH



The Glassteel Diffuser Equipped With a Cast-Aluminum Holder

COMPLETE LINES OF

Wire
Conduit
Switches
Safety Devices
Fuses
Insulators
Lamps
Lighting Units
Fixtures
Fans
Street Lights
Motors
Brushes
Etc.
Anything Electrical

QUICK DELIVERY

Picker Eveners

that are sluggish will not make a uniform lap. Covering cones with leather or some other covering will not cure the trouble.

Ball bearings will. They eliminate the friction that causes the slip of the belt. We make complete ball bearing equipments for eveners and aprons.

ALDRICH MACHINE WORKS

Ball Bearings

Greenwood, S. C.

Sun Glare Steals Costliest Energy

—human energy—the highest priced force in the world. Cross lights and reflected sunshine tire the sensitive optic nerve—sap brain and brawn of ambition and initiative—are chief cause of the day's "let-down" in thousands of sunny plants.

We smile at the siesta habit of the tropics—and yawn through long bright summer afternoons. The same sun that causes *light fatigue* at the equator, shines through your windows.

Give your workers the sensible restful protection of

AEROLUX
VENTILATING
WINDOW SHADES

—the durable, economical shades that give Air Without Glare—last for decades—a real investment in better conditions, contentment and increased production.

Made of long, straight linden wood strips, woven with hard twist seine twine—easily installed and operated —*suited for all types of sashes.*

SEND FOR FREE BOOK—"LIGHT AND THE TIRED WORKER." Tells every-day facts about light and fatigue—no meaningless statistics, but material from daily life. Find that proper shading is as important as proper lighting—without the upkeep expense.

The Aeroshade Company

(*Makers of the famous Aerolux Porch Shades for Residences, Country Clubs, etc.*)

2400 Oakland Avenue, Waukesha, Wis.

Air Without Glare

What is Paint?

"In what class do you put paint—expense or investment? It all depends on how and what you buy. If you buy on 'price in the can,' paint is an expense—a heavy one. But if you buy like the wise painter does on 'cost on the wall,' paint is an investment.

"Hockaday costs less on the wall. If you had time to take my brush you would quickly see why Hockaday saves money. You would check these reasons: Spreads ten to fifteen per cent further; no brushing required, takes less time to apply; only two coats in colors needed—no size, no primer; positively eliminates air checking, suction and lime burning."

You will be interested in knowing how Hockaday is saving money for such mills as the Watts, Mollohon, Pacolet, and many others. Without obligation one of our specialists would be glad to demonstrate how Hockaday will cut your painting cost.

THE HOCKADAY COMPANY

1823-1829 Carroll Avenue
CHICAGO

Southern Office, Newberry, S. C. O. H. Johnson, Mgr.

Don't compare Hockaday with "ready-mixed paints." It comes in a semi-paste form. Only our special reducer can be used for thinning.

HOCKADAY

THE WASHABLE PAINT FOR ALL INTERIORS

BRUSHES within themselves are of no value to you. They render a service only when they are put into action to increase production. The amount of service is estimated by the amount of the increase of production made possible by their use.

How then, are you to judge the worth of a brush? Simply by this method. A good textile brush is built to promote production, through cleanliness, with the least possible effort and time on the part of the employees who use it.

The quality and workmanship in the brush itself needs no comment. when you buy Perkins Practical Brush that is guaranteed.

ATLANTA BRUSH CO.
ATLANTA, GA.

ATLANTA BRUSH COMPANY
A Brush for every Textile Need

THE
"Southwestern" Iron Clad
Is the IDEAL Cotton Mill Broom

Only the best grade of broom corn is used in these brooms—they are built strong and will withstand the hardest usage.

The light weight, yet strong and substantial shields used gives the broom ample protection and at the same time allows the proper amount of broom corn to be used, thus giving them excellent sweeping qualities.

MADE RIGHT!
PRICED RIGHT!

Inquiries and orders receive prompt attention.
Sold direct and through
all principal distributors.

The Southwestern Broom Mfg. Co.
Evansville, Indiana

AMERICAN
SUPPLY COMPANY
PROVIDENCE, R. I.

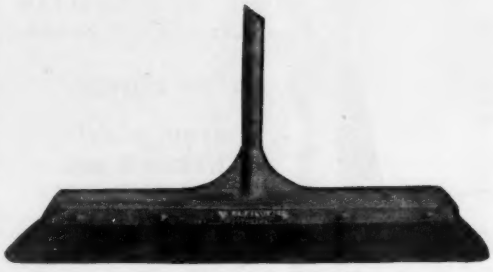
Manufacturers of
LOOM HARNESS,
WEAVING REEDS,
OAK TANNED LEATHER
BELTING, STRAPPING,
ETC.

We make a specialty of Harness for Warp Drawing Machines

Number 20

RE-FIL-IT TEXTILE SPECIAL

Aluminum Holder Corn Filler



Advantages of the Textile Special

1st. Loose corn from this brush is reduced to a minimum, making the waste more valuable.

2nd. It sweeps cleaner than the regular broom.

3rd. It is much faster than the old method, of sweeping, particularly in the spinning room.

4th. Fanning is unnecessary by this method, and the liability of lint getting into the thread is reduced to the minimum.

5th. Preference for the Textile Special is shown by the sweepers when they realize how much faster and easier it is than the old method.

6th. One holder will outwear many sets of fillers, and the savings in broom cost, during a period of six months or a year is very large.

Please write us for prices and full particulars.

Yours for Economy,

RE-FIL-IT BROOM MFG. COMPANY
185 Devonshire Street Boston, Mass.

Electric Scrubbing!

Mill Cleanliness
Starts with
CLEAN FLOORS

Floors are made *clean* and kept *clean* with least trouble and lowest cost by the FINNELL System.

One textile organization found that Finnell Equipment saved $12.000 a year in wages alone. Furthermore, it pays big profits in (1) Better working conditions; (2) cleaner production; (3) less waste and soilage; (4) *fewer accidents;* (5) healthier and happier employees. Compared to the FINNELL System hand and knee scrubbing is not only inadequate—it is extravagant. There is a profitable size outfit for any size mill. Write for large illustrated broadside containing complete information on the dividend-paying FINNELL SYSTEM.

Now Ready. Motion pictures of Finnell Machines in operation in textile mills. One of our experts will be glad to bring his projector to your mill and give a private showing. No obligation. Write

AMERICAN SCRUBBING EQUIPMENT SALES CO.
Also distributors of Finola Scouring Powder
General Offices and Factories
56 North Collier St. HANNIBAL, MO.

FINNELL SYSTEM
OF ELECTRIC SCRUBBING

DISTRICT OFFICES IN PRINCIPAL CITIES

"Clean Floors Reflect Clean Business"

THE BELGER CO., BOSTON, MASS.

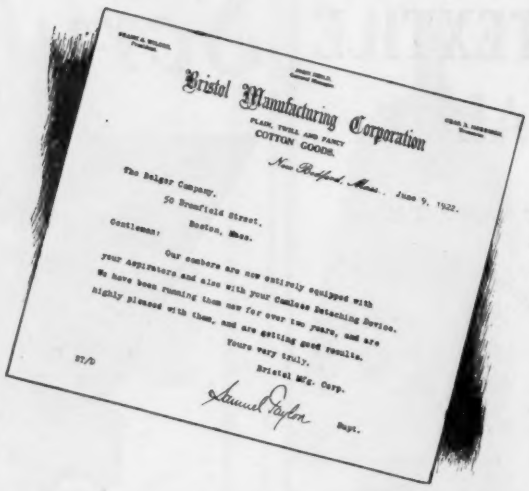
FORMERLY J. WEINBRENNER & CO.

Roth's Pat. Improved
ASPIRATORS
and Roll Waste Packers
for ALL MAKES OF
COMBERS

BETTER COMBED and
CLEANER SLIVER

SAVINGS in
WAGES,
HALF LAPS
AND BRUSHES.

WASTE of same good quality as with old doffer arrangement.


Bristol Manufacturing Corporation
PLAIN, TWILL AND FANCY
COTTON GOODS.
New Bedford, Mass., June 9, 1922.
The Belger Company.
50 Brownfield Street.
Boston, Mass.
Gentlemen:
Our combers are now entirely equipped with
your Aspirators and also with your Camless Detaching Device.
We have been running them now for over two years, and are
highly pleased with them, and are getting good results.
Yours very truly,
Bristol Mfg. Corp.
Supt.

PATENTED CAMLESS DETACHING MOTION for NASMITH Combers.

INCREASED PRODUCTION

with same good quality of combed sliver for which the Nasmith comber is so well known.

LESS POWER,

SIMPLIFIED SETTINGS and ADJUSTMENTS.

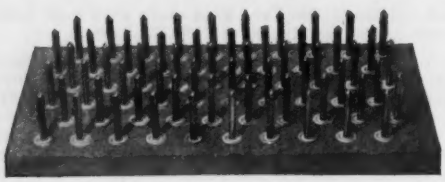
WASTE is drawn direct from brush to perforated cylinder.

WASTE delivered separately for each comber head.

NOISELESS WORKING—
This mechanism replaces the big cam, the quadrant and pinion, clutch, clutch operating cam and lever of the present machine.

ALSO IMPORTERS OF TURKEY RED YARNS FAST TO BLEACHING

KORE-LOKT PIN BOARDS
REG. U. S. PAT. OFFICE



Patent Rights Pending

Are You Responsible

for good weaving in your mill? If so, you should know Kore-Lokt Pin Boards and the story of their usefulness in modern loom equipment.

Expert Opinion from men in charge of the weave rooms in prominent mills is available to superintendents and overseers upon request.

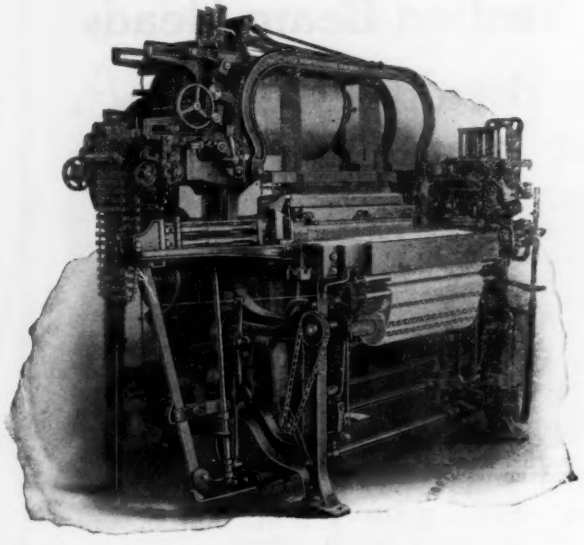
Send for this information so you may know the merits of Washburn Kore-Lokt Pin Boards as an improvement over old style Filling Boxes. Learn how the other fellow checks up results from the "Build of Bobbins."

NEW BEDFORD, MASS.

PERFECTION SHELL ROLLS

FOR
BLEACHERIES
BALL WARPING
FINISHING PLANTS
CORD FABRIC SHIPMENTS

NEW BEDFORD, MASS.



AUTOMATIC TERRY TOWEL LOOM

Built for Under Cam,
Jacquard
or
Dobby Harness Motion

CROMPTON & KNOWLES LOOM WORKS

WORCESTER, MASS.

PROVIDENCE, R.I. PHILADELPHIA, PA. PATERSON, N. J.
ALEXANDER & GARSED, CHARLOTTE, N. C.
Southern Representatives

A Shuttle Designed by Yourself

If you were asked to design the ideal shuttle for loom use your specifications would probably be somewhat like this: First, a shuttle eye that permitted the filling to run free and smooth. Next, springs that were practically unbreakable. The shuttle to be constructed of wood blocks thoroughly air-dried. To be without flaws or imperfections of any kind.

You would have written the exact specifications for Williams Shuttles. We make them to satisfy mill owners who demand the highest quality of the products they buy. Perhaps you would like to try out Williams Shuttles on your looms. A letter from you, asking for samples, places our staff of shuttle experts at your service, without obligation on your part.

The J. H. Williams Company

"The Shuttle People"

Millbury, Mass.

THE BELGER CO., BOSTON, MASS.

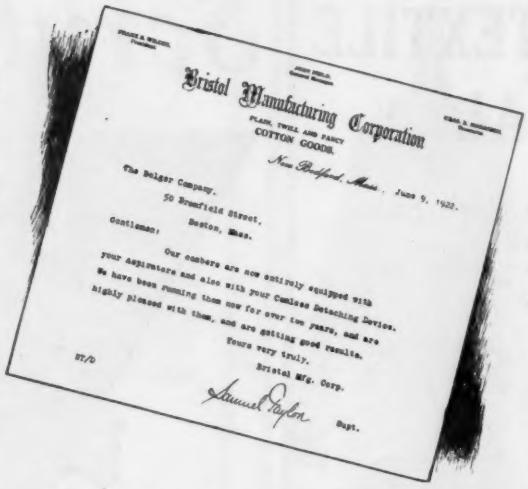
FORMERLY J. WEINBRENNER & CO.

Roth's Pat. Improved
ASPIRATORS
and Roll Waste Packers
for ALL MAKES OF
COMBERS

BETTER COMBED and
CLEANER SLIVER

SAVINGS in
WAGES,
HALF LAPS
AND BRUSHES.

WASTE of same good quality as with old doffer arrangement.


Bristol Manufacturing Corporation
PLAIN, TWILL AND FANCY
COTTON GOODS.
New Bedford, Mass., June 9, 1922.
The Belger Company,
50 Brumfield Street,
Boston, Mass.
Gentlemen:
Our combers are now entirely equipped with
your Aspirators and also with your Camless Detaching Device.
We have been running them now for over two years, and are
highly pleased with them, and are getting good results.
Yours very truly,
Bristol Mfg. Corp.
Supt.

PATENTED CAMLESS
DETACHING MOTION
for NASMITH Combers.

INCREASED
PRODUCTION

with same good quality of combed sliver for which the Nasmith comber is so well known.

LESS POWER,

SIMPLIFIED
SETTINGS and
ADJUSTMENTS.

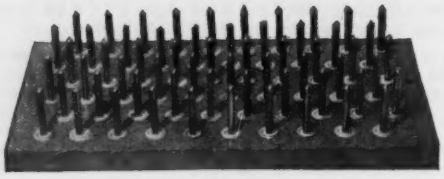
WASTE is drawn direct from brush to perforated cylinder.

WASTE delivered separately for each comber head.

NOISELESS WORKING—
This mechanism replaces the big cam, the quadrant and pinion, clutch, clutch operating cam and lever of the present machine.

ALSO IMPORTERS OF TURKEY RED YARNS FAST TO BLEACHING

KORE-LOKT PIN BOARDS
REG. U. S. PAT. OFFICE



Patent Rights Pending

Are You Responsible

for good weaving in your mill? If so, you should know Kore-Lokt Pin Boards and the story of their usefulness in modern loom equipment.

Expert Opinion from men in charge of the weave rooms in prominent mills is available to superintendents and overseers upon request.

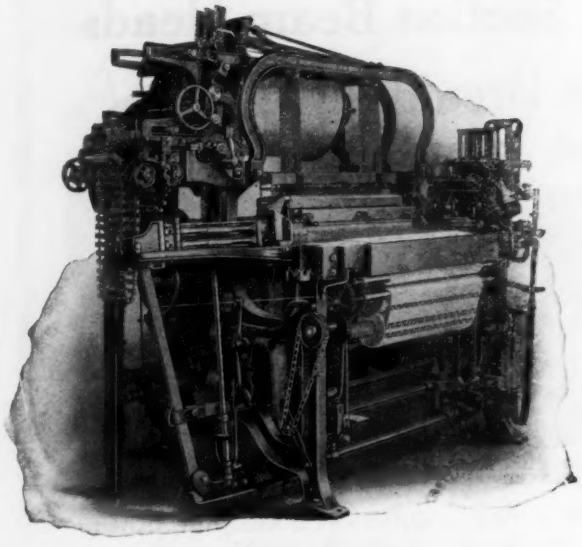
Send for this information so you may know the merits of Washburn Kore-Lokt Pin Boards as an improvement over old style Filling Boxes. Learn how the other fellow checks up results from the "Build of Bobbins."

NEW BEDFORD, MASS.

PERFECTION SHELL ROLLS

FOR
BLEACHERIES
BALL WARPING
FINISHING PLANTS
CORD FABRIC SHIPMENTS

NEW BEDFORD, MASS.



AUTOMATIC TERRY TOWEL LOOM

Built for Under Cam,
Jacquard
or
Dobby Harness Motion

CROMPTON & KNOWLES LOOM WORKS

WORCESTER, MASS.

PROVIDENCE, R.I. PHILADELPHIA, PA. PATERSON, N. J.
ALEXANDER & GARSED, CHARLOTTE, N. C.
Southern Representatives

A Shuttle Designed by Yourself

If you were asked to design the ideal shuttle for loom use your specifications would probably be somewhat like this: First, a shuttle eye that permitted the filling to run free and smooth. Next, springs that were practically unbreakable. The shuttle to be constructed of wood blocks thoroughly air-dried. To be without flaws or imperfections of any kind.

You would have written the exact specifications for Williams Shuttles. We make them to satisfy mill owners who demand the highest quality of the products they buy. Perhaps you would like to try out Williams Shuttles on your looms. A letter from you, asking for samples, places our staff of shuttle experts at your service, without obligation on your part.

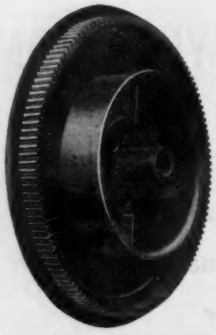
The J. H. Williams Company

"The Shuttle People"

Millbury, Mass.

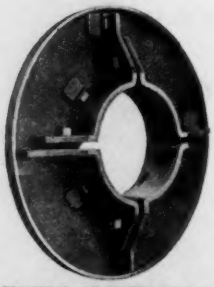
All Steel Loom and Section Beam Heads

Cannot Break
Do not Bend



"ALL STEEL" LOOM BEAM HEAD
"MALLEABLE" GEAR
Patent Pending

"ALL STEEL" SECTION BEAM HEAD
PATENTED



"ALL STEEL" ADJUSTABLE HEAD
SPLIT OR SOLID TYPE
PATENT PENDING

DUPLICATE YOUR CAST IRON HEAD IN STEEL — ELIMINATE ALL BREAKAGE
MAKE YOUR BEAM HEAD INVESTMENT PERMANENT

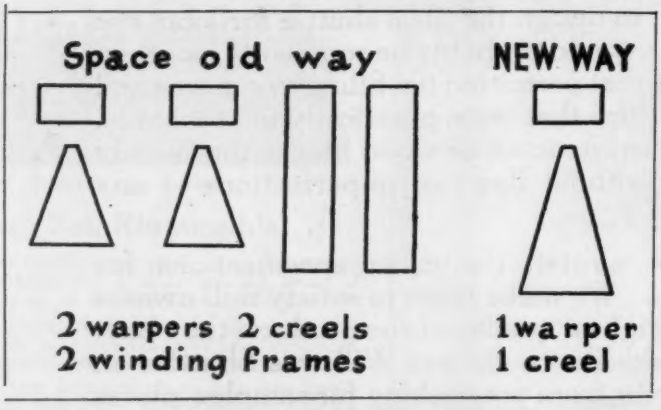
Mossberg Pressed Steel Corporation

Attleboro, Mass.

SOUTHERN OFFICE 201 AUGUSTA ST. GREENVILLE, S. C.

NEW AUTOMATIC CREEL

for direct warping from FILLING WOUND BOBBINS



COMPLETELY ELIMINATES the

Spooling of the yarn

Spooling waste

Undue and irregular tension of yarn due to spooling

Stoppage for doffing

Doffing is done while warper is running.
Greater production from better warps at lower cost.
Better loomage from auto-creel warps because
Elasticity is preserved in yarn.

For Information address

AUTO CREEL CORPORATION, NEW YORK

Room 915, Fifth Ave. Building
Alfred Suter, Sales Manager

Announcement!

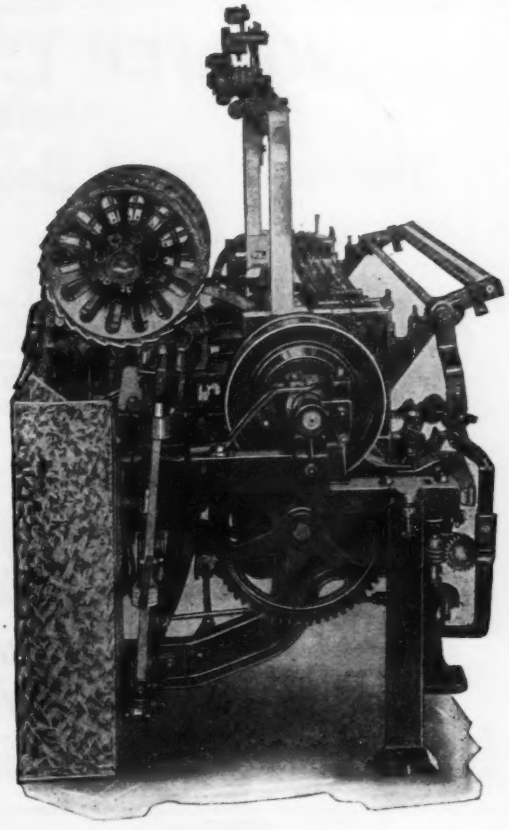
A machine that random dyes cotton, wool or silk yarn on cone by injecting the dye into the cone under pressure.

Write us for further information.

ECLIPSE
TEXTILE DEVICES,
INC.

ELMIRA, N. Y.

Makers of
Eclipse Automatic Yarn Cleaner
and Eclipse Automatic
Stop Motion



The Latest

NORDRAY
Automatic Loom

Multiple-harnesss, Feeler type

built by

HOPEDALE MANUFACTURING CO.

at MILFORD, MASS.

SOUTHERN OFFICE at
GREENVILLE, S. C.

This loom was shown at the Late Greenville Exposition and excited great interest.

It is Still the Simplest.

WALTER L. PARKER CO.

LOWELL, MASS.

Manufacturers of Bobbins, Spools and Skewers

OUR SPOOLS:—

Are made to stand severe service and are made from thoroughly dried stock, so constructed that they are giving entire satisfaction.

OUR BOBBINS:—

Are made from the best grade of stock, and through the efficiency of our workmanship, are true running, and properly fitted on spindles.

OUR PRODUCTS:—

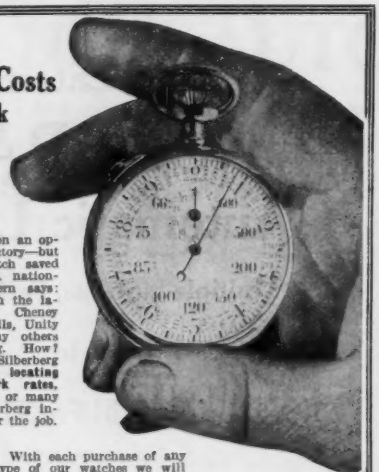
Bobbins—Warp and Filling. We put on all kinds of metal shields and caps.
Speeders—Plain; steel rings; metal base.
Spools—Warper; Twister.
Our Metal Bound Spools are pronounced the best on the market.
Skewers—Cop, Warper and Roving, of all descriptions.
Twisters—Universal Winder Rolls and Bobbins, Comber Rolls, etc.

We Specialize in New Mill Equipment

CHARLOTTE SUPPLY CO., SOUTHERN AGENTS.

Obtain Standardized Costs Set Piece Work Rates

Here's the Watch for Every Textile Time Study Job



Only six seconds waste on an operation in an eastern factory—but locating it with this watch saved thousands every year. A nationally known Textile concern says: "We eliminated one-fourth the labor, cut costs by 22%." Cheney Bros., Champlain Silk Mills, Unity Spinning Mills and many others are doing the same thing. How? By Time Studies with Silberberg watches. **Whether it's locating wastes, setting piece work rates, establishing bonus systems** or many other uses—there's a Silberberg instrument specially made for the job.

The Decimal Duration Watch—Gives production figures up to three minute jobs with special arrangements for timing jobs up to 30 minutes. It also has the decimal dial and "take out time" feature.

With each purchase of any type of our watches we will include **at no additional charge** one set consisting of our 3 Text Lesson Course on "TIME AND MOTION STUDY" including how to set **Piece Work Rates** and how to obtain accurate **Labor Costs.** All data contained therein broadens the scope and use of Time Study Watches in the Industries.

This course regularly sells for $10.00. **Absolutely FREE with each Watch.** Send for illustrated pamphlets and catalogues. **Any of our instruments on approval to responsible concerns.**

MORTIMER J. SILBERBERG CO.
Peoples Gas Bldg.
CHICAGO
Pioneers in the Manufacture and Sale of Time Study Watches.

The watch illustrated at the top with the decimal dial and "take out time" features give direct reading in production per hour up to one minute jobs.

The Master Chronograph

Cost

may be a primary consideration

The Liberty Knotter

not only fills the requirements of low first cost but is most simple in construction and economical in upkeep and operation. Give it a trial.

Guaranteed for one year
Write for information

A. B. CARTER, Sales Agent,

Gastonia, N.C.

Mill Devices Co. **Durham, N. C.**

VERMONT SPOOL & BOBBIN CO.

OF

BURLINGTON, VERMONT.

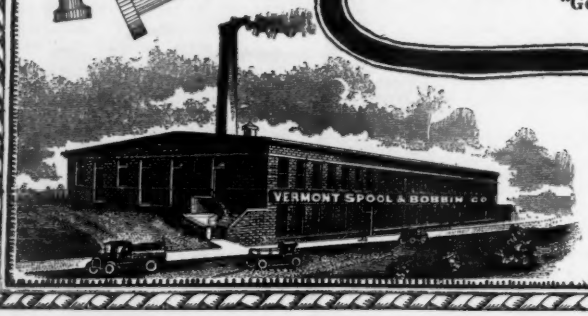
There are two prime requisites in the production of superior bobbins and spools—the plant and long experience. We have both.

Our plant is equipped with the most up-to-date and efficient machinery. From the selection of the wood to the finishing of the product the same care is exercised in every department—uniform bobbins and spools of the highest class being the result.

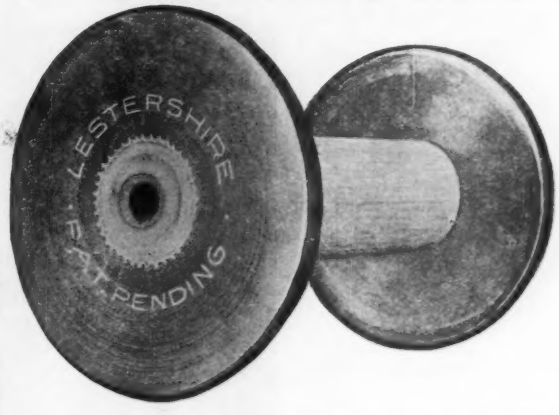
Our long experience in the design and manufacture of spools and bobbins for textile mills all over the country enables us to understand your requirements and give you 100% satisfaction.

Give us a trial order and you will remain one of our satisfied customers. Write for prices.

"Good Goods at Fair Prices."



What Part of the Spool is First to Wear Out?



Your superintendent will confirm our statement that 99% of all Warper, Twister or Spooler Spools become useless on account of the heads breaking, wearing rough or loosening. This is true of all types of Spools heretofore on the market.

With the Lestershire Type Vulcanized Fibre Head Spools just the opposite is true. The Heads will outwear the barrels because Hard Vulcanized Fibre (the same material from which end thrust bearings and automobile gears are made) will never break, wear rough nor splinter.

Of course the first cost is higher but, figuring your charges per thousand spools per year, they are by far the most economical spools on the market today.

In addition Lestershire Fibre Head Spools will in the ordinary mill give you an increased unloading production of nearly 50%. Put a row on your creel and compare the time necessary to unload with any other type Spool.

On the smooth Rock Maple barrel, cleanly jointed to the Fibre Heads which cannot get rough and cannot be dented, there is no place for the yarn to catch.

Spindle wear is also eliminated by bushings of hard well seasoned Dogwood.

Increased traverse can be had which will give you greater yardage on your spools. This means a saving of many dollars in the course of a year, not only direct but in labor required to change the spools.

At your request we will gladly send samples for purposes of test and comparison.

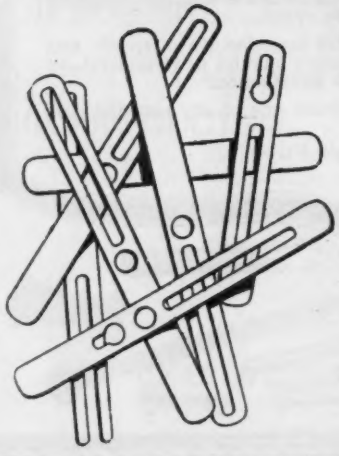
LESTERSHIRE SPOOL & MFG. CO.

Manufacturers Mill Spools, and Bobbins, of Every Description

General Offices and Factory
JOHNSON CITY, N. Y.

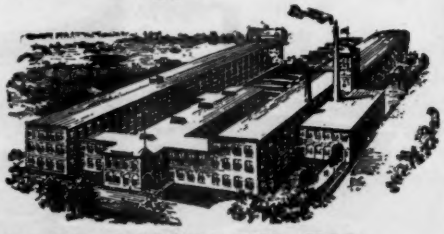
Southern Branch Office:
32 So. Church St.,
CHARLOTTE, N. C.

GREIST



Satin Finish Loom Drop Wires
are *Good Wires*

Uniformly made—free from burrs.
A reliable source of supply.



The
Greist Manufacturing
Company,
Dept. "C"
New Haven, Conn.

Southern Representative
SLAUGHTER-McCABE COMPANY, INC.
GREENVILLE, S. C.

SPINNING RING SPECIALISTS
1873 – FOR FIFTY YEARS – 1923

SPINNING RINGS
TWISTER RINGS
SILK RINGS

DIAMOND FINISH
TRAVELLER CLEANERS
TRAVELLER CUPS
GUIDE WIRE SETS

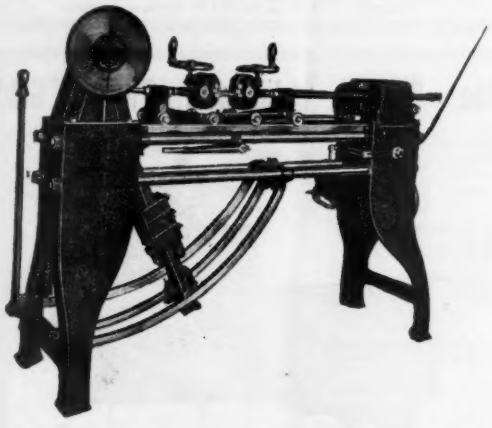
WHITINSVILLE
SPINNING RING CO.
WHITINSVILLE, MASS.

SCOTT TESTERS

Extract from The New Specifications For Numbered Cotton Duck for Commercial and Government Use

All tests for breaking strength shall be made on an approved type of inclination balance breaking machine. The maximum capacity of the machine shall be 800 pounds.

The 1 in. x 1 in. x 3 in. grab method of testing shall be used, defined as follows: The lower half of each pair of jaws shall be 2 inches or more in width, and the upper half shall be 1 inch in width. Jaws shall be planed smooth and flat, with edges slightly rounded to prevent cutting. The initial length of the test pieces between the jaws of the testing machine shall be 3 inches, and the pulling jaw shall travel at a uniform rate of 12 inches per minute.



SCOTT HORIZONTAL INCLINABLE BALANCE TYPE FABRIC TESTER, 800 LBS. CAPACITY

Official equipment in Government Offices and Technical Institutions and for over ten years the preference of the trade for tests of heavy fabrics.

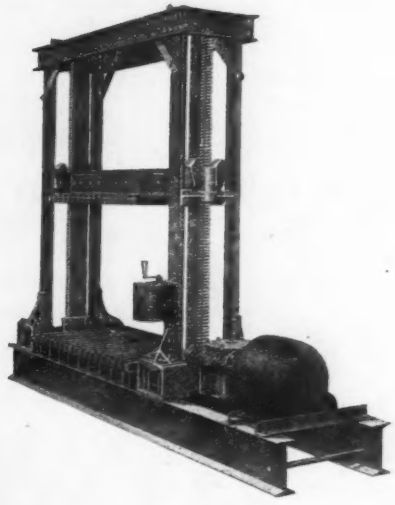
The machine whose constant dependable performance has won for itself the position of THE RECOGNIZED AMERICAN STANDARD and the only one that ever met the requirements for both laboratory and routine testing.

We also make the Standard Equipment for testing Yarns, Twines, Light Fabrics, Rubber, etc.

Catalog on request.

HENRY L. SCOTT & CO.
BLACKSTONE & CULVER STS., PROVIDENCE, R. I.

Another REX PRESS



New Cloth Press

Speed, Strength, Simplicity

Built any size and pressure.

The Rex Creed

To build a press so good that the simple truth about it will be adequate recommendation and to price it so fairly that its value can never be questioned.

Watch for the Yarn Press.

REX ENGINEERING CORPORATION

Dunkirk, N. Y.

J. S. HULME
Southern Representative
Atlanta Trust Co., Bldg.
ATLANTA, GA.

Leading cotton and silk mills order Lewis Box Trucks and Shipping Boxes

For their remarkable durability in hard service—for their aid in cutting production costs and making it easier to handle delicate fabrics—Lewis Box Trucks and Shipping Boxes are in demand by leading textile mills everywhere, including these typical users:

Holeproof Hosiery Co., Milwaukee, Wis.
Durham Hosiery Mills, Inc., Durham, N. C.
Vesta Underwear Co., Providence, R. I.
Crane Bros., Kingston, Pa.
Francis Willey & Son, Boston, Mass.

This recognized superiority of the Lewis line comes of 30 years experience in weaving wood and wire into the most durable containers and those that give lowest final cost. Write us regarding Lewis containers and the newest ideas for handling textiles in process and in shipment.

G. B. LEWIS COMPANY
WATERTOWN DEPT. C-6 WISCONSIN

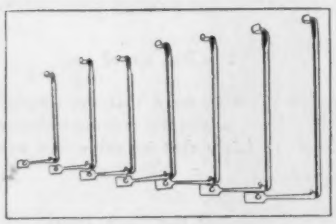
Save one-third the freight cost by having them shipped knocked down.

Automatic Scales
For Weighing or Checking

Raw Material	Bobbins
Sorts	Roving
Soap, Alkali and Dyes	Yarn
Balls and Sliver	Yardage
Test Pieces	Section Beams
Tops	Shipments
Laps	And for many other purposes.

Toledo Scale Company, Toledo, Ohio
Canadian Toledo Scale Co., Limited, Windsor, Ontario
Largest Automatic Scale Manufacturers in the World
106 Sales Rooms and Service Stations in the United States and Canada. Others in thirty-four foreign countries

Need New Flyer Pressers?



Most of the Southern Textile Mills use our Flyer Pressers. If you are not yet acquainted with their tremendous possibilities, we advise you to at least give them a trial.

Made of the best obtainable Norway Iron, of proper design, great strength and lasting smoothness. Perfectly fitted before leaving our factory

No wonder so many textile mills use them.

Southern Spindle & Flyer Co., Inc.
CHARLOTTE, N. C.
Manufacturers, Overhaulers and Repairers of Cotton Mill Machinery

W. H. MONTY, Pres. and Treas.
W. H. HUTCHINS, V. Pres. and Sect.

The Palmer Adjustable Thread Guide

For Ring Spinning and Twisting Frames

Easily Adjusted.

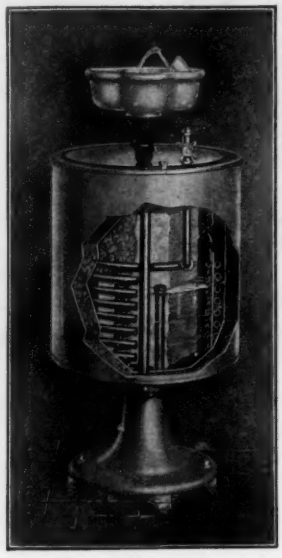
Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY
Middletown, - - - Connecticut



No. 570-A

Why Do Corporations Install Halsey-Taylor Cooler Fountains?

Where efficiency methods have reached their peak, and where the welfare of employees is given most serious thought—in those plants HALSEY TAYLOR Fountains are invariably found—one to each 25 to 50 employees.

Time study has proved that HALSEY TAYLOR Fountains save their cost the first few months—comparative tests have proved them more efficient, because of the automatic stream control, the practical drinking mound and superior construction.

Write today for 32-page catalog and prices.

THE HALSEY W. TAYLOR COMPANY

No. 525 N. PARK AVENUE, WARREN, OHIO

BRANCHES

NEW YORK CITY
137 East 43rd Street
PHILADELPHIA
5224 Greene Street
BOSTON
46 Cornhill, Room 512
ATLANTA
322 N. Jackson Street
CHICAGO
1702 N. Talman Ave.
KANSAS CITY
202 Baltimore Bldg.
DENVER
401 Jacobson Bldg.
SAN FRANCISCO
237 Rialto Bldg.

HALSEY TAYLOR

The Renewable Basket

Here's something new that's an asset rather than an expense. The method of construction of the new

SMITH'S BETTER 100% BASKET

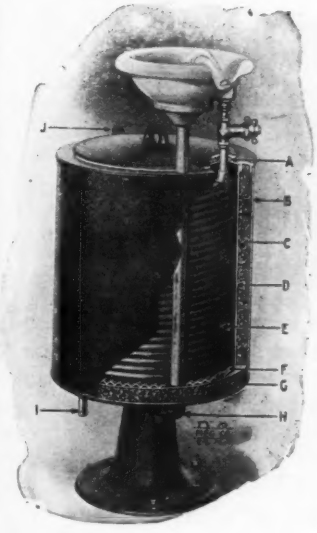
enables you to save ½ the cost of the complete basket by slipping on a renewable canvas container when the old one wears out. The frame is indestructible, flat round edge steel, fitted and clamped to hardwood skids with cross slats. The demountable rim to which canvas container is attached permits basket being shipped knocked down, thus saving freight charges.

A trial will convince you of the advantages of this basket.

Order one on trial today

SMITH MFG. CO.
DALTON, GA.

Don't Make Them Hunt for Drinks



Workmen who are forced to leave the bench or machine every hour or so and hunt for a drink at some inaccessible hydrant or pail are not producing what they should. That may not cost much for one man—but think of the expense if the whole mill does it.

There's only one way to avoid that waste—provide them with plenty of cold, invigorating drinks **on the job.** Cover the whole mill with

RUNDLE-SPENCE "VERTICO-SLANT" Fountains

The increase in efficiency will more than pay for the investment—that's the verdict of hundreds of users.

Note the sanitary features of the R. & S. Fountain. The stream is thrown up at an angle, preventing germs from falling back into the jet. **Lips cannot touch the nozzle.** These fountains are always clean and inviting and are built to give years of dependable service.

There is a type of R. & S. fountain for every mill or office use. If you have not decided in favor of drinking fountains—do it now. Write today for our new 74-page catalog.

Rundle-Spence Mfg. Co.
Milwaukee, Wis.
Leaders in Plumbing Equipment Since 1871.

An Important Message to every Mill Official

There's no doubt that you are a rigid enforcer of Sanitation in your mill lunch room and community service departments. But, did you ever question the canned foods eaten by your employes? Are they put up in the most sanitary way possible?

El-Flo Community Canning Outfit

are used in Textile Mills everywhere to put up can foods for mill lunch rooms and community store uses. The *El-Flo* canner is quick, easy to operate, safe, sanitary and economical. Send for booklet.

HOME CANNER MFG. CO.
HICKORY, NORTH CAROLINA

TRADE MARK

LOWELL MILL CRAYONS

the original crayons for textile mill use, and for years the standard with America's leading mills.

Lowell Crayons are made in white and 15 colors, as follows:

1	2	3	4	5	6
Yellow	Red	Pink	Blue	Purple	Brown
7	8	9	10		11
Black	Green	Orange	Dark Green		Light Red
12	13	14	15		
Rose Pink	Light Green	Light Blue	Orange No. 2		Wh.

Order by number, please.

LOWELL CRAYON CO.
Lowell, Mass.

Decimal Tabulator is a Part of All Silent Models

The decimal tabulator is an inbuilt part of all Silent Smiths and is furnished at no additional expense.
The decimal tabulator saves time and insures accuracy.
As many columns can be written on the sheet as are desired. The keys are located in the keyboard, easily accessible and requiring no change of the regular operating position of the hands.
It is invaluable in billing and tabulating.

Send for free illustrated catalog.

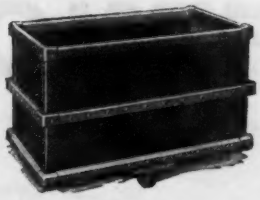
L. C. Smith & Bros. Typewriter Co.
Home Office and Factory: SYRACUSE, N. Y.
Branches in all Principal Cities.

REEDS

For Cotton, Woolen, Worsted, Silk, Tire Fabrics, Webbing, and Wire Cloth.

We make a specialty of all Metal reeds, for Tire Fabrics, and Leno work.

HAYES LOOM REED & HARNESS CO.
182 Farm St. Woonsocket, R. I.



A Tough Lightweight—The Laminar

The life of a mill truck or receptacle is a hard one—kicks and scuffs, collisions and bumps, come its way with disheartening regularity.

The truck built of ordinary material that is made strong enough to stand the gaff of its daily life not only rumbles noisily but is hard on floors and is heavy to push. Receptacles of ordinary materials that are strong enough to last long are too heavy for easy moving.

But—there are trucks and receptacles of Vul-Cot Fibre, Laminar Mill receptacles—that wonderful material that is so strong, so tough and sturdy that it is practically indestructible and yet is lighter than any substitute for it.

Write today and we will gladly send you full particulars and prices.

National Vulcanized Fibre Co.
Wilmington, Delaware

MEECO

SANITARY DRINKING FOUNTAINS

are

ECONOMICAL
DURABLE
PRACTICAL
EFFICIENT

Low first cost and up-keep.

Write today for proof.

METAL MEECO PRODUCTS

ICE COOLED

MFG. EQUIPMENT & ENG. CO.
Originators and Largest Makers of Ice Cooled Drinking Fountains
FRAMINGHAM, MASS., U. S. A.

An Ever *Increasing Demand* For "AMTEX"

SPINNING, TWISTING AND SPOOLER TAPES

From

Southern Spinners

THE QUALITY AND PRICE RECOMMEND THEM

Manufactured by

AMERICAN TEXTILE BANDING CO., Inc.

GERMANTOWN, PHILADELPHIA, PENNA.

Sold in the South by
Charlotte Supply Co., Charlotte, N. C.
James Supply Co., Chattanooga, Tenn.
Montgomery & Crawford, Spartanburg, S. C.

Don't Fumble in Your Pocket for a Card

Six times out of ten it will be soiled, and a soiled card is worse than none at all.

How much wiser and more convenient to carry a handsome leather booklet of Wiggins cards!

No waste to Wiggins Cards, as they are protected by tissue and do not soil—they're always fresh and white and detach with a smooth straight edge.

You'll like Wiggins Cards because they have that distinctiveness, that superior richness, which only the work of master engravers will give to your cards.

Write today for Specimen Pad and information.

THE JOHN B. WIGGINS CO.
Established 1857
1110 So. WABASH AVE. CHICAGO, ILL.

WIGGINS Peerless Book Form **CARDS**

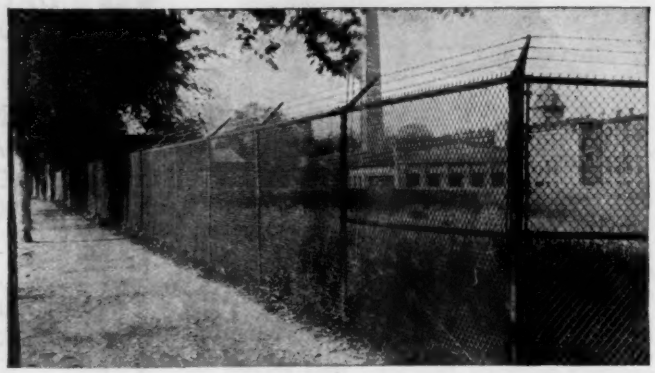
CYCLONE FENCE

The Cyclone Fence Company offers textile mills unusual advantages in the fencing of industrial property.

Speed, quality, efficiency and intelligent application of fence to grounds enclosed are all combined in Cyclone Service. Every fencing problem is handled professionally and completely. Satisfaction guaranteed.

Our years of experience in fencing thousands of industrial plants, among them hundreds of textile mills, is at your disposal. Let us know your requirements. Fencing, wire or iron, built for any purpose.

Write Dept. 35 for literature including specifications and details of Cyclone Fence construction. No obligation.



Cyclone Invincible Chain Link Fence Enclosing Property of International Cotton Mills, LaGrange, Ga.

CYCLONE FENCE COMPANY

Factories and Offices: Waukegan, Ill.; Cleveland, Ohio; Newark, N. J.; Fort Worth, Texas; Oakland, Calif. (Standard Fence Co.); Portland, Ore. (Northwest Fence & Wire Works).

The "Red Tag" — The Mark of Quality

PROPERTY PROTECTION PAYS

PRINTING

WE do it for some of the largest mills in the South—*Why not for yours?*

If our prices and service were not right, we could not do it.

THE A. J. SHOWALTER COMPANY

Dalton, Georgia.

Send for FREE story

Interesting, illustrated folder "How to get Greater Desk Efficiency" shows how to keep your desk cleared for action. Thousands of Kleradesks are giving entire satisfaction. Saves time locating, distributing or sorting papers. Takes less space than a tray. Sent FREE trial.

Kleradesk

ROSS-Gould Co 418 N. 10th ST. LOUIS

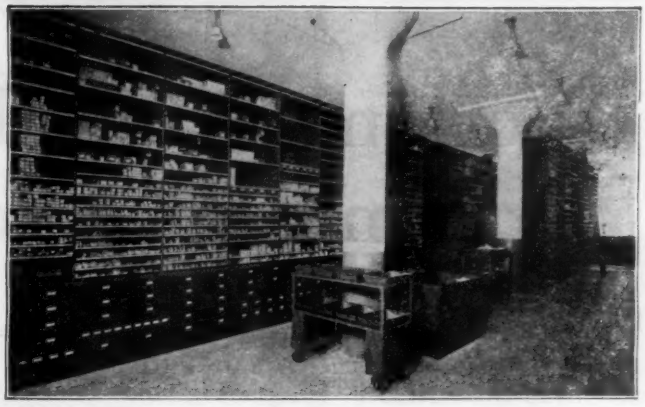
Mailing Lists

Will help you increase sales

Send for FREE catalog showing details covering names of your best prospective customers. Counts and prices are given on thousands of different Mailing Lists.

99% Guaranteed by refund of 5¢ each

ROSS-Gould Co 418 10th Street St. Louis



Hammel, Riglander & Company of New York carry in stock over thirty-five thousand individual items, varying in size and quantity. Every item is instantly available, whether ordered by name or number. This is but one instance of the adaptability of Lyon Steel Shelving to the most complicated storage requirements.

The enviable reputation of Lyon Steel Products is due not only to exclusive features of design which give both strength and flexibility, but also to the unequailed Lyon Engineering Service. This service is at your disposal without cost to you. Please write us and we will be glad to send a Lyon engineer to analyze your requirements and submit an economical and convenient storage plan.

LYON METALLIC MANUFACTURING COMPANY

AURORA, ILLINOIS

New York Philadelphia Indianapolis Detroit Chicago
Boston Rochester Pittsburgh Cleveland Los Angeles

Authorized Agents in Other Principal Cities

TU- TUPELO, "The Hard-Wear Lumber," has about every advantage there could be for textile mill flooring.

The "Hard-Wear Lumber"

PE-

"Works Easy —Wears Hard"

It is a "softwood," yet by reason of its "involved" grain it resists severe friction for many profitable years, without the usual tendency to slivering or splintering. Ask your Efficiency Engineer to investigate Tupelo—and then tell you. We invite correspondence with a serious purpose in it.

LO

SOUTHERN CYPRESS MFRS. ASSOCIATION

805 POYDRAS BUILDING, NEW ORLEANS, LOUISIANA, or
805 GRAHAM BUILDING, JACKSONVILLE, FLORIDA

A Working Principle—Not an Embalmed Ideal

A B P STANDARD No. 2

"To subscribe to and work for TRUTH and honesty in ALL departments."

FEW there are who do not know of the great TRUTH and BETTER BUSINESS movement, which was inaugurated by the Associated Advertising Clubs of the World about ten years ago.

It was the fused and awakened sentiment of the publishing and advertising interests, that to them belonged the responsibility for purifying the stream of publicity and keeping it clean.

Since then these men have procured the adoption of clean advertising laws in nearly every state, with Vigilance Committees to enforce them. The crooks and swindlers have been driven from the pages of reputable publications, and the power and virility of straight truth-telling has been brought home to all advertisers.

As the Business Press Department of the National Advertising Commission of the A. A. C. of W., The Associated Business Papers, Inc., is proud and glad to be a part of this work. We have incorporated the TRUTH motive into our own standards and our practices.

Note well the word "ALL" in Standard No. 2. It applies with equal force to *all* departments of our papers—editorial as well as advertising.

As a logical sequence of Standard No. 2, we adopted Standard No. 5

A B P STANDARD No. 5

"To decline any advertisement which has a tendency to mislead, or which does not conform to business integrity."

THIS imposes a definite obligation upon A B P papers which can not be misunderstood. In this Standard, our publishers plainly acknowledge their responsibility to their subscribers, and pledge themselves to keep the trusteeship inviolate.

Do you not begin to see why business papers aspire to A B P membership; why membership carries the prestige that it does; and why A B P papers are getting preferred consideration from those who believe in high standards especially when coupled with practical achievement?

THE ASSOCIATED BUSINESS PAPERS, INC.

JESSE H. NEAL, *Executive Secretary*

HEADQUARTERS: 220 WEST 42nd STREET NEW YORK CITY

COTTON is a member of the A P B Inc.

ELECTRICAL SUPPLIES

GENERAL ELECTRIC CO.'S PRODUCTS—MOTORS, WIRE, WIRING DEVICES, ELECTRICAL, PORCELAIN CONDUIT AND FITTINGS, TRUMBULL SWITCHES.

Complete Stocks in Columbia for Prompt Shipment.

DISTRIBUTING JOBBER

PERRY-MANN ELECTRIC COMPANY

COLUMBIA, S. C.

Ware Paint Co.

Wood Preservatives, Stains, All colors Metallic and Composition Paints

SAVE THE SURFACE WITH W WARE WEATHER PAINTS TRADE MARK REG.

Barn Paints, Roof Coating Roofing and Roofing Materials

Atlanta, Ga.

Defeats the Costly Ravages of Weather and Wear

Makes all surfaces—wood, metal or composition — moisture proof; rust proof; rot proof.

Adds years of serviceable life to every part of the mill. Best of insurance against replacement or repair costs.

Used and recommended by Industrial Plants and Cotton Mills, everywhere.

Distributors of FLINTKOTE Roofing.

Our Application Department will be glad to give you estimates on applying new roofs. **Our service Department at your call—any time—anywhere.**

Best for the Southern Climate

Over thirty years ago the Cooledge chemists began working on formulae for an outside house paint which would best withstand the Southern climate, a paint that would wear longer and hold its original color. After years of tests these formulae have been perfected.

PROVE IT YOURSELF

Cooledge Hygrade Mill Cottage Paints are the most economical paints you can buy. The best way (though it takes a long time) to convince yourself of this fact is to paint half of the mill cottages with one paint and the other half with Cooledge Hygrade. Long after the other paint had faded, cracked and peeled, Cooledge Hygrade will be giving perfect service.

The REASON

The reason is simply this: Cooledge Hygrade Mill Cottage Paints are made **especially for the Southern climate** from formulae perfected after years of experiments and tests. Yet Cooledge Hygrade costs no more than ordinary paints.

Write us today for special quotations on 500 gallons, 1000 gallons and up. Also ask for prices on our shingle stains.

We will make paint exactly according to your engineer's specifications if you prefer, but we strongly advise the use of our own formulae.

COOLEDGE CH HYGRADE
Paints and Varnishes

Manufactured Exclusively by

F. J. COOLEDGE & SONS

ATLANTA

CHARLOTTE SAVANNAH TAMPA

YOUNGSTOWN

Youngstown Pipe

Is used in many of the largest and finest humidifying systems in the great Cotton Mills of this country. Its High Quality and Uniformity recommend it to the firms who manufacture and install these systems. These same features recommend it for every purpose for which Pipe is used, and it will be found enough better than ordinary pipe to fully justify insistence that it shall be used for all purposes in which steel and iron pipe are commonly employed.

The Youngstown Sheet & Tube Company

Youngstown, Ohio

District Sales Offices:

BOSTON—120 Franklin St.
NEW YORK—30 Church St.
PHILADELPHIA—Pennsylvania Bldg.
ATLANTA—Healey Bldg.
PITTSBURGH—Oliver Bldg.
CLEVELAND—1038-1040 Hanna Bldg.
DETROIT—2021-2022 First Nat'l. Bank Bldg.
CHICAGO—McCormick Bldg.
ST. LOUIS—1139 Olive St.
DENVER—First Nat'l Bank Bldg.
DALLAS—1401-2 Magnolia Bldg.
SAN FRANCISCO—604 Mission St.
SEATTLE—Central Bldg.

VOGEL PATENTED

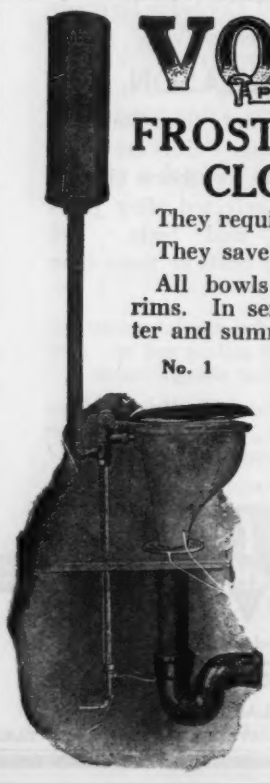
FROST PROOF CLOSETS

They require no pit.

They save water.

All bowls have enameled rims. In service daily, winter and summer.

No. 1



OVER 350,000

Giving

Satisfaction in

All Climates

The ideal water closets for Factories and Mill Villages, where thousands have been installed.

The most durable water closets made — excepting none.

Every Fixture Tested Under Hydraulic Pressure Before Leaving Factory.

INSIST ON GETTING THE VOGEL

Ask your jobber

JOSEPH A. VOGEL CO.

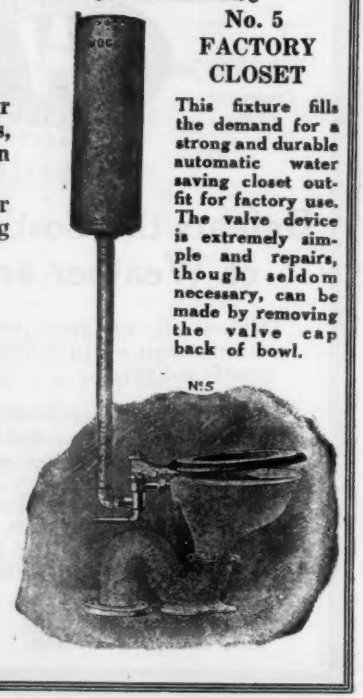
Factory and Office at

WILMINGTON, DEL.

VOGEL PATENTED

No. 5 FACTORY CLOSET

This fixture fills the demand for a strong and durable automatic water saving closet outfit for factory use. The valve device is extremely simple and repairs, though seldom necessary, can be made by removing the valve cap back of bowl.



Chapman

"You Pay for them Whether You Buy them or Not"

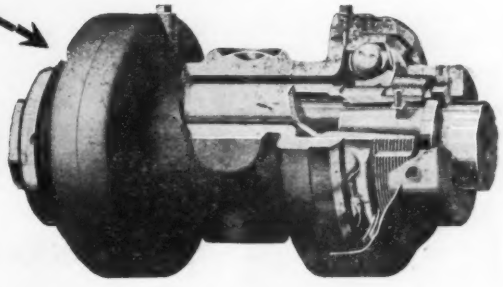
The place to save power is in the lineshaft bearings—they are the biggest wasters

Here's the Remedy

Install Chapman Ball Bearings—they fit every standard hanger without a change—and save from 15% to 35% of the lineshaft power that formerly went to waste.

Use this excess saved power for driving more machinery or speeding up the present installation. ***It's clear profit in your pocket.***

Say the word and we will send you actual facts and figures of what has been saved in other mills.



THE TRANSMISSION BALL BEARING CO., INC.

ELIMINATORS OF BEARING TROUBLES

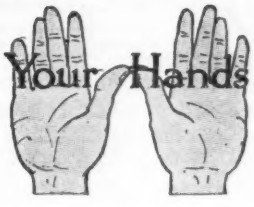
1050 MILITARY RD. BUFFALO, N. Y.

You don't need special machines or an expert belt lacer—when a belt breaks—just

A Hammer

A Piece of Soft Wood

Your Hands



and BRISTOL'S

TRADE MARK REG. U. S. PAT. OFFICE.

PATENT STEEL BELT LACING

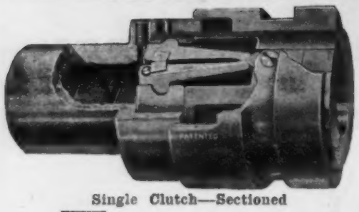
You will have a more satisfactory job and realize a generous saving in time and money—if your own men do your belt repairing with Bristol's Belt Lacing.

Ask for copy of Bulletin 713-J

THE BRISTOL COMPANY WATERBURY, CONN.

Boston New York Philadelphia Pittsburgh Chicago Detroit St. Louis San Francisco

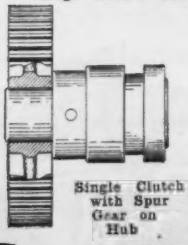
THE JOHNSON FRICTION CLUTCH



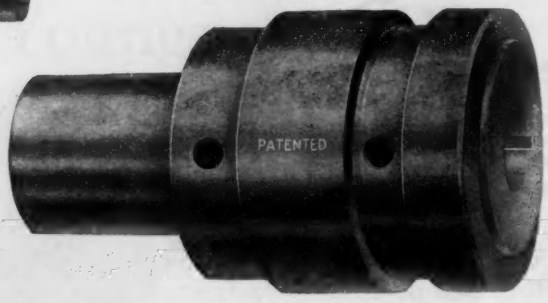
Single Clutch—Sectioned

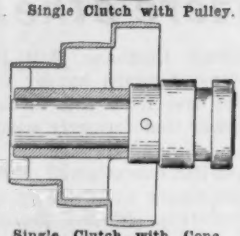
Count the Cost of Power Transmission
by Using JOHNSON CLUTCHES
as Illustrated
"BE SURE IT'S A JOHNSON"

Single Clutch with Pulley.

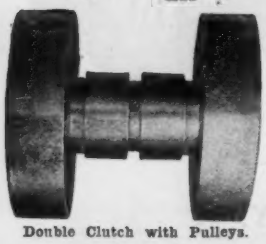


Single Clutch with Spur Gear on Hub





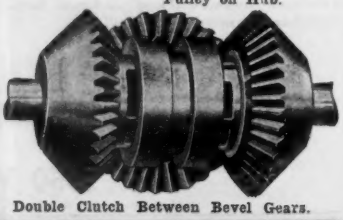
Single Clutch with Cone Pulley on Hub.



Double Clutch with Pulleys.

THE JOHNSON SINGLE CLUTCH

WRITE
FOR
CATALOG "G"



Double Clutch Between Bevel Gears.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

LUNKENHEIMER
Bronze Gate Valves

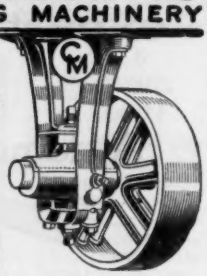
Due to correct design, the use of only the best materials procurable, and skilled workmanship, long and satisfactory service is assured. Longevity of the valves as a whole is further enhanced by renewability of any worn or broken parts.

The extensive line of Lunkenheimer Gate Valves permits of a selection for any specific purpose and for all general prevailing pressures, making possible the standardization of these Valves throughout the plant with the resultant assurance of satisfactory service and economy of maintenance.

Catalog 58-AK portrays the entire line. A copy will be sent upon request.

11012-10-10

CRESSON-MORRIS
POWER TRANSMITTING MACHINERY



Power transmitting machinery
Shafting
Rope transmission
Machine moulded and cut iron and steel gears for heavy service.
Complete plant equipment.
Engineers; founders; machinists.
Sugar centrifugals.

CRESSON-MORRIS CO.

18th Street and Allegheny Ave.
PHILADELPHIA, PENNSYLVANIA

X180-X

Sixty Years Experience as Engineers · Founders · Machinists

CYCLONE HOISTS
HIGH SPEED

—give one man the strength of a giant

AN 80-lb. pull on the hand chain of a Cyclone Hoist will lift a ton.

If suspended from a Chisholm-Moore "Matchless" Trolley a 14-lb. pull will carry this one ton load to any point where the overhead track leads.

Cyclone Hoists multiply man power! One man with a Cyclone can replace a gang of men using strong-arm methods.

Increase the productiveness of your men by putting Cyclone Hoists in your plant!

Built in capacities from 1 to 40 Ton. Catalog describes our Hoists, Trolleys and Cranes, and Overhead-Track Systems. Write

THE CHISHOLM-MOORE MFG. COMPANY

Hoists — Cranes — Trolleys
Overhead-Track Systems

CLEVELAND

Branches: New York, Chicago Pittsburgh

Distributors Everywhere

TO express strength, courage, physical perfection, efficiency, endurance, tenacity and faithfulness all in a single word, common practice has got us in the habit of using the word SPARTAN. And it is all because of an organization of thoroughbreds who adhered to certain fixed principles some 3000 years ago. This is the reason why Graton & Knight Manufacturing Company named a most extraordinary belt SPARTAN.

Spartan Leather Belt

clings to the job day and night under the most trying conditions because it is built for its work all the way from tannage. It has the quality to hold the most vital point in the power line. Its manufacture is governed by well defined laws. On drives that require Spartan courage in belting, G & K Spartan will prove its worth as did the Spartans of old.

Write for our booklet "The Spartans"

G K SPARTAN

The Graton & Knight Mfg. Co.

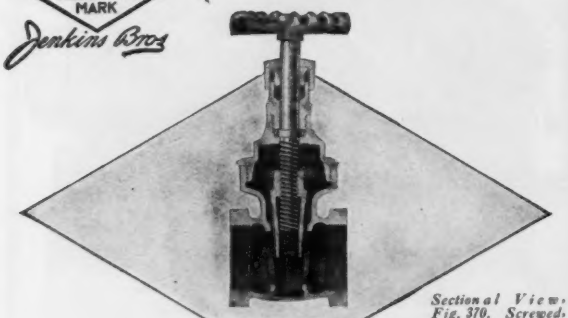
OAK LEATHER TANNERS, MAKERS OF LEATHER BELTING AND OTHER LEATHER SPECIALTIES

Worcester, Mass., U. S. A.

Made for maximum service not merely the average

TRADE JENKINS MARK

Jenkins Bros



Sectional View, Fig. 370. Screwed, Standard Bronze Gate Valve.

GOOD STRONG GATE VALVES for all requirements

Fig. 325. Screwed, Standard Iron Body Gate Valve, inside screw, stationary spindle.

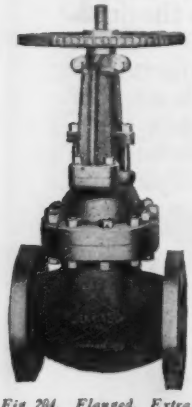


Fig. 204. Flanged, Extra Heavy Iron Body Gate Valve, outside screw and yoke, rising spindle.

You will find Jenkins Gate Valves, as all Jenkins Valves, of a design that provides reserve strength to meet the severest service in the use for which they are recommended.

Great care is exercised to make perfect castings, which are accurately machined to insure an exact unity of parts.

Interchangeability is a feature, and "veteran" installations of Jenkins Valves can always be supplied with parts that fit.

Only a few valves in our comprehensive line of gate valves are shown. We make bronze, iron, and steel gate valves in standard, medium, and extra heavy patterns for all pressures and purposes.

Obtainable through supply houses everywhere.

JENKINS BROS.

New York Boston Philadelphia Chicago
Montreal London

FACTORIES: Bridgeport, Conn.; Elizabeth, N. J.; Montreal, Can.

2810-J

Always marked with the "Diamond"

Jenkins Valves

SINCE 1864

Save Man Power

THE time and money that is being lost every day because of inefficient material-handling methods will quickly repay the cost of an electric hoist. An Euclid Electric Hoist or Crane operated by one man, can do more work than ten men with a chain block or hand crane. It will save time, preventing men and machines standing idle, save man power, and increase production.

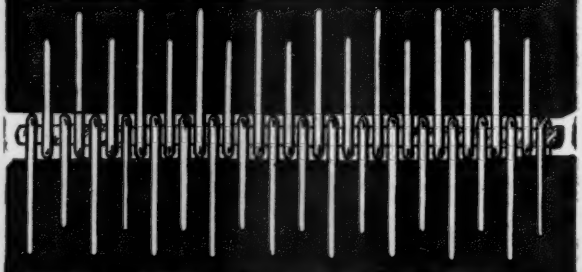
Ask for the catalog showing the styles and types for textile mill use. The Euclid is the most dependable and efficient type of hoist made.

EUCLID CRANE & HOIST CO.,
EUCLID, OHIO.

EUCLID CRANES AND HOISTS

"DETROIT" BELT LACING

Replacing endless belts everywhere. Flexible, smooth, very strong. Each Detroit Hook has a pulling strength of over 100 lbs. Leaves the belt stronger than any other lacing because of perfect staggered grip, less destruction from perforation, and proper degree of stiffness, quality, proportion, size and shape of hooks.



SAVES time, labor, belts, power, money and annoyance. Detroit Belt Lacing is dependable. Hooks and closing machines to meet every requirement.

Write for card, "Right size of hooks to order" and full particulars.

Detroit Belt Lacer Co., Detroit, Mich.

Branch offices in large cities

Bull Dog Lacer Co., Hamilton, Ont., Can. Nicholson Clipper Co., Manchester, Eng.

Industrial Leaders Favor Godfrey Equipment

WHEN a firm like the Van Camp Company buys machinery of any kind you may know that its purchase has been the result of a thorough investigation.

Organizations of this caliber are not content with mere specifications and promises of satisfactory performance. They insist upon seeing the machine in actual operation, doing the same work that will be required of it when installed at their plant.

And that's exactly what the Van Camp Company did when they adopted the *Godfrey Conveyor* for the handling of coal and ashes at their great plant in Indianapolis. Their engineers visited other plants equipped with the *Godfrey*, watched it unload coal from hopper-bottom cars, timed its delivery to bins and boiler room, compared it with other types of equipment—and then placed their order.

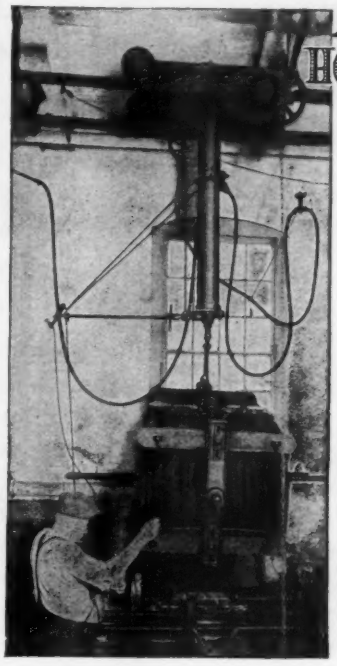
You too will find the *Godfrey* a safe investment and one that will yield substantial dividends. You too can profit by the experiences of others in choosing your coal and ash handling equipment. We'll gladly tell you who has the *Godfrey* nearest you.

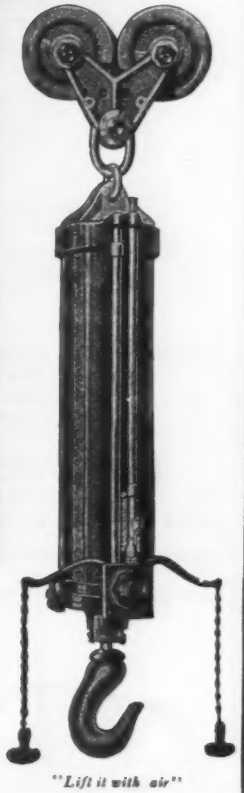
Ask for Catalog Z

GODFREY CONVEYOR COMPANY

Elkhart, Indiana, U. S. A.

CURTIS AIR HOISTS





Used in The Textile Industry

"Lift it with air"

Curtis one man All Steel Air Hoists and Curtis Roller Bearing Trolleys are effecting important economies in leading textile mills throughout the country.

Why not install a Curtis Air Hoist and operate it with the air you now have available? The wide variety of uses to which Curtis equipment can be most economically applied is worthy of your immediate investigation.

Curtis Pneumatic Machinery Co.

1571 Kienlin Ave. St. Louis, Mo.

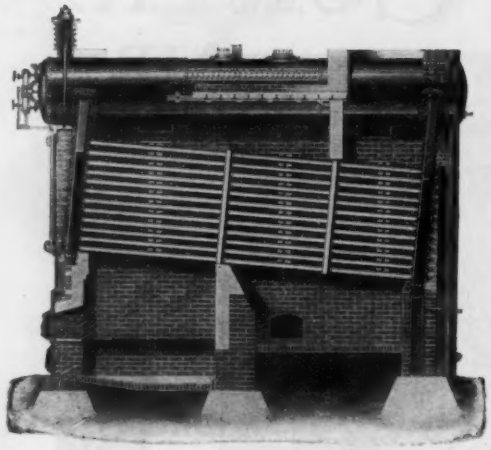
Branch Office

532-R Hudson Terminal New York

CURTIS AIR COMPRESSORS-HOISTS-TROLLEYS-CRANES ST. LOUIS

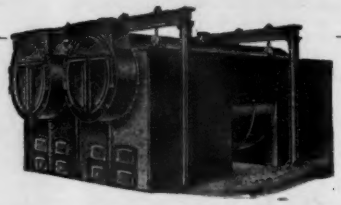
Established 1854

WATER TUBE BOILERS



HORIZONTAL WATER TUBE BOILERS
VERTICAL WATER TUBE BOILERS
TUBULAR AND MARINE BOILERS
STEEL CASINGS, SMOKE STACKS

THE CASEY-HEDGES CO.
CHATTANOOGA, TENN.
Quick Shipment Our Specialty. Send for Catalogs.



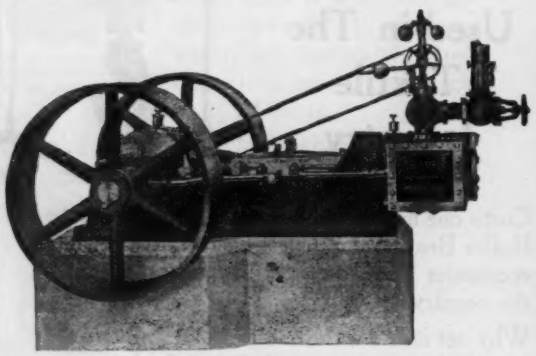
The Result of a Quarter Century Experience

These years of experience and study together with exhaustive tests and improvements, has enabled us to build modern boilers that are second to none—in design, construction, high efficiency and capacity, economical operation, and low cost for upkeep.

Made in several types. Write us today and let us send you full data and reasons why the W & W BOILER will best meet your reqwirements.

The Walsh & Weidner Boiler Co.
CHATTANOOGA, TENN.

WALSH & WEIDNER
TUBULAR WATER TUBE **BOILERS**



J. S. Schofield's Sons Co.
Macon, Georgia
MANUFACTURERS OF
High Pressure Return Tubular Boilers, High Grade Stationary Steam Engines, Tanks, Stacks, Stand Pipes.
Heavy Castings and Wrought Iron Works.

Standard Oxygen

Cuts Repair Costs

Oxy-acetylene welding is saving textile mills thousands of dollars monthly. But still more economies can be effected if you use only the PUREST gas you can obtain.
STANDARD Oxygen is 99.5% pure—the best that can be bought.
We can not only supply oxygen and supplies and Welding Equipment, but we can send experts to your mill to instruct your mechanic how to use them.
Write us for more detailed information.

Standard Gas Products Co., Inc.
ATLANTA

Commission Merchants, Yarn Dealers, Cotton Dealers and Brokers, Banks, Etc.

Real Double Carded COTTON YARN

SPUN BY

THE MYRTLE MILLS, (INC.)

At our Myrtle plant we run choice, white, long staple cotton through two complete sets of cards. This produces a yarn so smooth and clean that it is often judged to be a combed yarn. It is spun in sizes ranging from 36s to 60s, single and ply, in right twist, suitable for knitting, weaving, mercerizing, and converting purposes; and in left twist, in sizes 30s to 45s, suitable for thread converting purposes.

Quotations and samples promptly submitted.

H. A. FLORSHEIM, *General Sales Mgr.*

225 Fifth Avenue **New York, N. Y.**

Also exclusively representing

GRAY MFG. CO.
FLINT MFG. CO.
ARLINGTON COTTON MILLS
PARKDALE MILLS, INC.
ARROW MILLS, INC.
ARKRAY MILLS, INC.

Weimar Bros.

Phone Connections

Works, 2046-48 Amber Street,

PHILADELPHIA, PA.

MANUFACTURERS OF

Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

WOODWARD, BALDWIN & CO.

DRY GOODS

Commission Merchants

43-45 WORTH STREET, NEW YORK

CARVER-BEAVER YARN CO.

Successors to A. D. SALKELD & BRO., Inc.

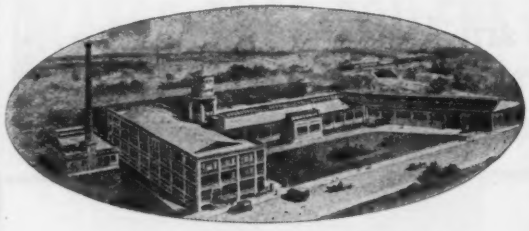
ALL NUMBERS COTTON MERINO YARNS ALL COLORS WOOL WORSTED

366 BROADWAY, NEW YORK

STENCILS FOR COTTON SHIPPERS COTTON MILLS MERCHANTS & MANUFACTURERS ALSO BRUSHES INK MARKING POTS

RUBBER STAMPS NOTARIAL CORPORATION SEALS

ATLANTA RUBBER STAMP & STENCIL WORKS



View of our Mercerizing and Bleaching Plant

BOGER & CRAWFORD

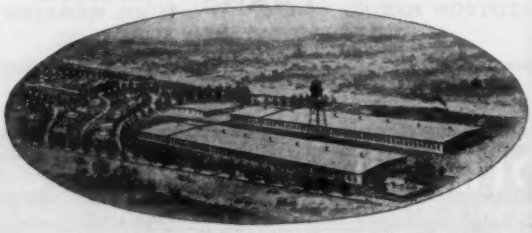
Established 1908

Spinners, Bleachers, Dyers and Mercerizers of High Grade Combed Yarns

By using our Spinning and Mercerizing you are always assured of a standard product.

"From the Cotton Field Direct to You"

Main Office, Factory and Warehouse
J and East Venango Sts., PHILADELPHIA



Spinning Mills, Lincolnton, N. C.

$2.50 Per Day

and upward

is one reason for the rapidly growing popularity of the Hotel Martinique.

Another is the consistent economy of the entire establishment. Here you may enjoy a Club Breakfast at 45c., consisting of Fruit or Cereal, Bacon and Egg, and Rolls and Coffee —Special Luncheon and Dinners of superior quality are also served at the most moderate possible prices.

No location can be possibly more convenient than that of the Martinique. One block from the Pennsylvania Station (via enclosed subway)—Nine blocks from Grand Central—one block from the greatest and best Shops of the City—half a dozen blocks from the Opera and the leading Theatres —and directly connected with the Subway to any part of the City you wish to reach.

"The BEST without extravagance"

Hotel Martinique

Affiliated with Hotel McAlpin

Broadway-32nd to 33rd Sts.
NEW YORK

A. E. Singleton, *Manager.*

Callaway Mills

INCORPORATED

345 Madison Avenue

Phone—Murray Hill 7801

NEW YORK

SELLING AGENTS
Unity Cotton Mills
Milstead Manufacturing Co.
Elm City Cotton Mills
Manchester Cotton Mills
Hillside Cotton Mills
Unity Spinning Mills
Villa Rica Cotton Mills
Athens Manufacturing Co.

Boston Representative
M. R. ABBOTT
110 Summer Street

Chicago Representative
RAY T. JOHNSON
226 W. Adams Street

J. B. JAMIESON CO.

77 SUMMER ST.

BOSTON MASS.

Commission Merchants

COTTON YARNS

of all descriptions for weaving and knitting.

We solicit accounts.

Wire or write us any offerings.

F. W. LAFRENTZ & COMPANY

announce that they will handle all Auditing, Accounting, Systematizing and Tax Work heretofore done by them under the name of The American Audit Company.

F. W. Lafrentz, C. P. A. (N. Y.)
A. F. Lafrentz, C. P. A. (N. Y.)
C. B. Bidwell, C. P. A. (Ga.)

AT

1013 Fourth National Bank Bldg.
Atlanta, Ga.

'Phone Walnut 0869

ESTABLISHED 1872

H. & B. BEER

NEW ORLEANS

HENRY BEER
J. WILLIAM BARKDULL
EDGAR H. BRIGHT
C. MORGAN ABRAMS

MEMBERS OF
New Orleans Cotton Exchange
New Orleans Future Brokers Association
New York Stock Exchange
New York Cotton Exchange
New York Coffee Exchange
New York Produce Exchange
Chicago Board of Trade

Associate Members of the Liverpool Cotton Association

Private Wires to Principal Points

HUGHES FAWCETT

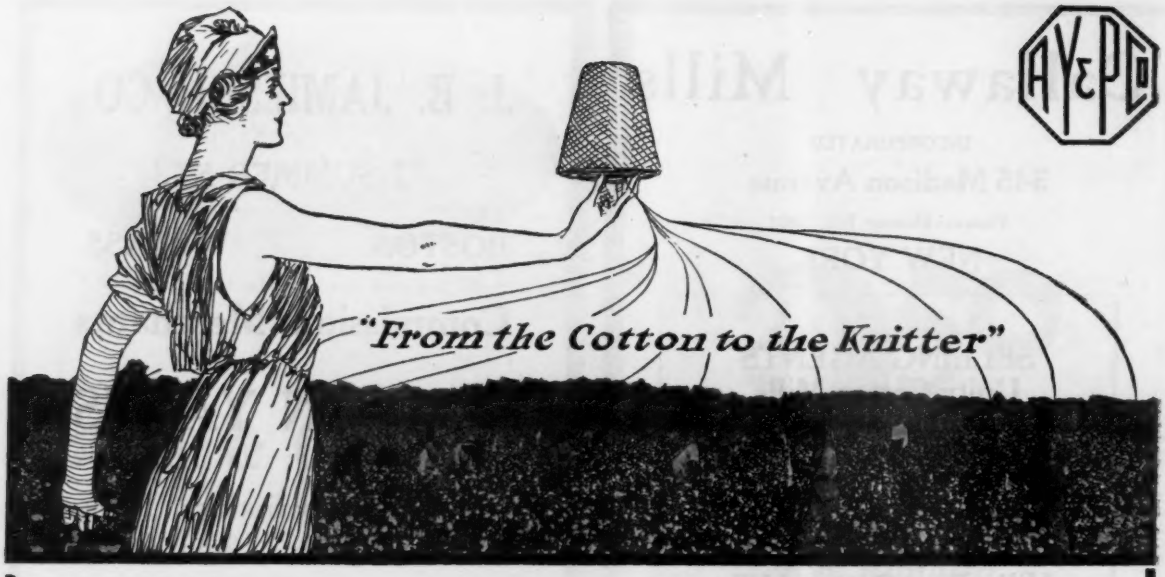
IMPORTER AND COMMISSION MERCHANT

LINEN YARNS
For Weaving, Knitting and all Purposes.

TURKEY RED YARNS
For Towel Borders, Towellings and Bleaching Cloth

Linen Jacquard Harness Twine
And Every Description of Linen Thread and Twine

115 Franklin Street, : NEW YORK



AMERICAN YARN & PROCESSING CO.

MOUNT HOLLY, N. C.

SPINNERS AND MERCERIZERS

HIGH GRADE COMBED AND CARDED YARNS—16s to 80s

Our Mercerized Yarns Are the Product of Our Own Mills

General Office, Mt. Holly, N. C. **Branch Office, 1111 James Bldg., Chattanooga, Tenn.**

Representatives

H. B. ROBIE, 346 Broadway, New York City **FORREST BROS., Forrest Bldg., Philadelphia**

THE MADISON SQUARE HOTEL

37 Madison Ave., at 26th St.

New York City

Facing Madison Square Park—The Heart of the Cotton Trade

"Live and eat in the same place"

Rooms (European Plan)		Meals	
Single	$2.50 up	Club Breakfast	60c and 75c
Double	$3.50 up	Luncheon	75c
Parlor, Bedroom and Bath	$5.00 up	Home Cooked Dinner	$1.25

A la carte service also.

A New York Home for Southerners

Write for Guide Map of New York. **Management—E. Russell Carlile**

CLASSIFIED ADVERTISING

RATES:

DISPLAYED.

"For Sale" and all other advertisements using bold-face type or otherwise displayed, $2.00 per inch per insertion.

Rates for larger spaces furnished on application.

WITHOUT DISPLAY.

"Positions Wanted" 3 cents per word per insertion. Minimum charge 50 cents. Payable in advance.

"Positions Open" and other undisplayed advertisements, 4 cents per word per insertion. Minimum charge $1.00. Payable in advance.

(*When replies are to be received in our care, allow four words for box address,*)

New and Second Hand

ENGINES

Corliss Automatic and Slide Valve

BOILERS

Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

Lathes, Planers, Shapers, Drill Presses, etc.

WOOD WORKING

Planers, Molders, Band Saws, etc.

ELEC. MACHINERY

Dynamos and Motors

AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,

127-31 N. Third St.

Philadelphia, - Pennsylvania

FOR SALE

LAND, BUILDINGS AND EQUIPMENT

ABOUT 100,000 SQ. FT. OF LAND, FIVE BUILDINGS, VARIOUS SIZES, WITH AN AREA AGGREGATING ABOUT 30,000 SQ. FT.. BUILDINGS PIPED FOR STEAM, WATER AND FIRE PROTECTION; WIRED FOR POWER WITH PROVISIONS FOR 40 MOTORS. ALL BUILDINGS HAVE CONCRETE FLOORS WITH SUITABLE DRAINS.

BOILER ROOM EQUIPMENT CONSISTS OF SIX H.R.T. BOILERS, COCHRANE WATER HEATER, INJECTOR AND HOT WELL. FIVE CAR CAPACITY COAL BUNKER AND A 1000 H.P. STACK. A CONCRETE RESERVOIR WITH A CAPACITY OF 250,000 GALLONS AND A 1000 GALLON UNDERWRITER'S STEAM DRIVEN FIRE PUMP.

THIS PROPERTY IS NEAR THE RAILROAD STATION AND DOCKS; ABOUT 25 MILES FROM THE CENTER OF NEW YORK CITY.

THE PROPERTY ALSO INCLUDES A 7-ROOM FRAME DWELLING HOUSE IN GOOD CONDITION.

THE LAND, BUILDINGS AND EQUIPMENT ARE OFFERED FOR SALE AT A LOW FIGURE ON LIBERAL TERMS.

BOX 79, care COTTON,
ATLANTA, GA.

WANTED

Manager for new 10,000 spindle weaving mill in Alabama.

Only man of wide experience considered. Must invest from twenty-five to fifty thousand dollars. Don't apply unless qualified.

Address
"ALABAMA,"
care COTTON,
Grant Bldg., Atlanta, Ga.

FOR SALE

30 CROMPTON & KNOWLES 37" JACQUARD LOOMS; 95 CROMPTON & KNOWLES 37" DOBBY HEAD LOOMS WITH MULTIPLIER. PRACTICALLY NEW, PRICE LOW. WRITE

BOX 436, LOWELL, MASS.

EXECUTIVE

Seeks Desirable Connection

MAN with number years experience in manufacture of Cotton Goods, also engineering and costing experience, anxious to make desirable connection with good organization. Past connections have been with large organizations and positions held have been in the executive capacity. At present employed as Sup't. of Yarn Mill. Good technical training. Age 33. Best of reference. Address Box 63, care of COTTON, Grant Bldg., Atlanta, Ga.

WANTED—Position as Electrician. Experienced in management of dynamos, motors, armature windings, wiring distribution systems. Address Box A, care COTTON, Atlanta, Ga.

Do You Want to Sell It?

Probably you, like many other mills, have some equipment which you have taken out, or are thinking of taking out and replacing with new equipment.

Why not dispose of this second-hand equipment at a profit? COTTON is read by thousands of Cotton Mills that are hardly touched by Northern journals.

You Can Sell Your Second-Hand Equipment

to these mills through advertising in the Classified Advertising Section of COTTON. Such advertising produces results at small cost—why not try it out and get that second-hand equipment off your hands in a profitable way? Tell us what you have for sale and let us insert an advertisement for you.

COTTON

GRANT BUILDING ATLANTA, GA.

Buyers' Index

ACETYLENE GAS.
Oxweld Acetylene Co.
Standard Gas Products Co.

ACETYLENE WELDING APPARATUS.
(See Welding Apparatus.)

ACIDS.
(See Dyestuffs and Chemicals.)

ACCOUNTANTS.
Ernst & Ernst.
La Frentz & Co., F. W.

ACCOUNTING SYSTEMS.
Ernst & Ernst.

ADDING MACHINES.
Monroe Calc. Mch. Co.

AERATING AND CLEANING MACHINE.
Murray Co., The.

AIR WASHERS.
American Blower Co.
Buckeye Blower Co.
Carrier Eng. Corp.
Parks-Cramer Co.
Sturtevant Co., B. F.

AIR COMPRESSORS.
(See Compressors.)

AIR CONDITIONING SYSTEMS
(See Humidifying Apparatus.)

ALBONE.
Roessler & Hasslacher Chemical Co.

ALKALIES.
(See Dyestuffs and Chemicals.)

ALUM.
(See Finishing and Sizing Materials.)

ANILINE COLORS.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE ACID GENERATOR.
Macomb Machine Co.

APRONS—RUB.
Bond Co., Chas.

ARCHITECTS AND ENGINEERS.
American Industries Eng'g Co.
Lockwood, Greene & Co.
Robert & Co.
Sirrine, J. E.
Stuhrman, Edw. A.

ARMATURE REWINDING.
(See Repairing—Electrical.)

ARTWORK.
Jacobs & Co.

ASH HANDLING MACHINERY.
(See Coal Handling Machinery.)

ASPHALT SLATE SHINGLES.
(See Slate Asphalt Roofing.)

ASPIRATORS.
Belger Co.

AUDITORS AND ACCOUNTANTS.
Ernst & Ernst.
La Frentz & Co., F. W.

AUTO TRUCKS.
(See Trucks—Auto.)

AUTOMATIC CONTROLLERS (TEMPERATURE).
(See Temperature Regulators.)

AUTOMATIC LOOM ATTACHMENTS.
(See Loom Attachments.)

AUTOMATIC FEEDS FOR COTTON.
Philadelphia Drying Mchy. Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Sargent's Sons Corp., C. G.
Whitin Mch. Works.

AUTOMATIC SCALES.
(See Scales.)

AUTOMOBILES.
White Co.

AWNINGS.
Smith Mfg. Co.

BACKWASHERS.
Sargent's Sons Corp., C. G.

BAGS (COTTON PICKER).
Smith Mfg. Co.

BAGS (COIN OR MONEY).
Smith Mfg. Co.

BAGS (COAL).
Smith Mfg. Co.

BAROMETERS.
Taylor Instrument Co.

BALL BEARINGS.
Aldrich Mch. Works.
Dodge Mfg. Co.
Fulton Supply Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.

BALL BEARING HOUSINGS.
Aldrich Machine Works.
Fafnir Bearing Co.
Fulton Supply Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.

BALE BAND BUCKLES.
(See Box Strapping & Buckles.)

BALE OPENERS.
(See Openers.)

BALING MACHINES.
Crompton & Knowles Loom Wks.
Draper Corporation.
Economy Baler Co.
Logemann Bros.
Rex Eng'g Corp.
Saco-Lowell Shops.

BALING PRESSES.
(See Presses.)

BANDAGES, TAPES, ETC.
American Textile Banding Co.
Weimar Bros.

BANDAGE & TAPE MACHINES.
Foster Machine Co.
Whitin Mch. Wks.

BANDS.
(See Tapes.)

BANDS (HOSIERY LABELS AND STICKERS).
Kirby-Cogeshall Co.

BARRELS—FIBRE.
(See Fibre Products.)

BASKETS—MILL.
(See Boxes—Mill.)

BATH CABINET—SHOWER.
Crane Co.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

BATTERIES (ELEC.)
(See Storage Batteries.)

BEAMS.
Mossberg Pressed Steel Corp.
U. S. Bobbin & Shuttle Co.

BEAM DYEING MACHINES.
Brandwood, John.
Cocker Mch. & Fdry. Co.

BEAM HEADS.
Jordan Mfg. Co.
Mossberg Pressed Steel Corp.
U. S. Bobbin & Shuttle Co.

BEAMING AND WARPING MACHINERY.
(See Warpers and Warping Machinery.)

BEARINGS.
Cresson-Morris Co.
Dodge Mfg. Co.
Fulton Supply Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Renold, Inc., Hans.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.

BELTING (LEATHER, CANVAS AND RUBBER).
American Supply Co.
Bond Co., Chas.
Fulton Supply Co.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELTING—CHAIN.
Dodge Mfg. Co.
Fulton Supply Co.
Link-Belt Company.
Morse Chain Co.
Renold, Inc., Hans.

BELTING (ROUND—LEATHER).
Bond Co., Chas.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.

BELTING—ROPE.
(See Rope Transmission.)

BELT CONVEYORS.
Dodge Mfg. Co.
Fulton Supply Co.
Link-Belt Company.
Morse Chain Co.

BELT DRESSING.
Bond Co., Chas.
Dixon Crucible Co., Jos.
Fulton Bag & Cotton Mills.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELT FASTENERS.
Bristol Co.
Carr Fastener Co.
Clipper Belt Lacer Co.
Detroit Belt Lacer Co.
Fulton Supply Co.

BELT LACING (LEATHER).
Bond Co., Chas.
Dodge Mfg. Co.
Fulton Supply Co.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. B.
Williams & Sons, I. B.

BELT TIGHTENERS.
Dodge Mfg. Co.
Fulton Supply Co.
Link-Belt Company.
Rhoads & Sons, J. E.
Wood's Sons Co., T. B.

BELT TIGHTENER DEVICE FOR CONE PICKERS.
Bahan Textile Mch. Co.

BENCH DRAWERS.
Lupton's Sons Co., David.

BENCH LEGS (PRESSED STEEL).
Lupton's Sons Co., David.

BENCHES (PARK AND PLAYGROUND).
(See Playground Equipment.)

BLEACHERIES.
(See Dyers, Bleachers and Finishers.)

BLEACHING KIERS.
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machry. Co.
Woolford Wood Tank Co., G.

BLEACHING MACHINERY.
(See Dyeing, Bleaching and Finishing Machinery.)

BLEACHING, FINISHING AND SIZING MATERIALS.
(See Finishing Materials.)

BLOWERS AND BLOWER SYSTEMS.
American Blower Co.
Buckeye Blower Co.
Carrier Eng. Corp.
General Electric Co.
Philadelphia Drying Mchry. Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

BOARDS—FIBRE.
National Vulcanized Fibre Co.
Standard Fibre Co.

BOARDS—FORM.
Pearson, Jos. T.

BOBBINS.
Draper Corporation.
Fulton Supply Co.
Jordan Mfg. Co.
Lesterahire Spool & Bobbin Co.
Parker Co., Walter L.
Vermont Spool & Bobbin Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Works.

BOBBIN HEADS.
Jordan Mfg. Co.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

BOBBIN STRIPPERS.
Crompton & Knowles Loom Works.
Terrell Machine Co.

BOILERS.
Casey-Hedges Co.
Cole Mfg. Co., R. D.
International Engineering Wks., Inc.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Toomey, Frank.
Walsh & Weidner Boiler Co.

BOILER COMPOUNDS.
Dixon Crucible Co., Jos.

BOILER FEED WATER PURIFICATION.
American Water Softener Co.
Casey-Hedges Co.
Norwood Engineering Co.
Scaife & Sons, Wm. B.

BOILER ROOM FITTINGS AND SUPPLIES.
American Blower Co.
Bristol Co.
Casey-Hedges Co.
Crane Co.
Dixon Crucible Co., Jos.
Fulton Supply Co.
Godfrey Conveyor Co.
International Engineering Co.
Jenkins Bros.
Lunkenheimer Co.
Nashville Industrial Corp.
Sturtevant Co., B. F.

BOILER GRATES AND STOKERS.
(See Grates and Stokers.)

BOOKKEEPING MACHINES.
Monroe Calc. Mch. Co.

BOX STRAPPING AND TIE BUCKLES.
(See Banding Straps and Buckles.)

BOXES—MILL.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
National Vulcanized Fibre Co.
Smith Mfg. Co.
Standard Fibre Co.

BOXES—PACKING.
(See Packing Boxes.)

BRAID.
(See Tapes.)

BRAZING.
(See Welding.)

BRICK (BUILDING & PAVING).
National Paving Brick Mfg. Asso.

BROKERS—COTTON.
(See Cotton Dealers & Brokers.)

BROKERS—STOCK.
(See Stocks and Bonds.)

BROOMS.
(See Brushes.)

BROOMS—REFILLABLE.
Re-Fil-It Broom Mfg. Co.
Wonderlich Co., H.

BRUSHES—MILL.
Atlanta Brush Co.
Re-Fil-It Broom Mfg. Co.
Southwestern Broom Mfg. Co.
Wonderlich Co., H.

BRUSHES—MOTOR AND GENERATOR (COMMUTATOR).
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co

BUCKETS AND PAILS—MILL.
Standard Fibre Co.

BUCKETS—ELEVATOR AND GRAB.
Link-Belt Company.

BUCKLES—COTTON TIE.
(See Box Strapping and Ties.)

BUILDING CONTRACTORS.
(See Contractors.)

BUILDINGS (PORTABLE STEEL).
Dowman, George.
Dowman-Dozier Mfg. Co.

BUILDINGS (READY BUILT).
Minter Homes Co.

BUILDINGS (ALL STEEL).
Dowman, George.
Truscon Steel Co.
Maryland Metal Building Co.

BUILDING MATERIAL.
Anchor Post Iron Works.
Barrett Co., The.
Birmingham Slag Co.
Bogart & Carlough Co.
Coolidge & Sons, F. J.
Detroit Graphite Co.
DeVilbiss Mfg. Co.
Dowman-Dozier Mfg. Co.
Dowman, George.
Dufur & Co.
Knapp Fence Co.
Lupton's Sons Co., David.
Maryland Metal Building Co.
Minter Homes Co.
National Paving Brick Mfg. Asso.
Richardson Co.
Sanymetal Products Co.
Sonneborn Sons, Inc., L.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.
St. Louis Surfacer & Paint Co.
Truscon Steel Co.
Variety Fire Door Co.
Wagner Mfg. Co.
Walker Electric & Plb. Co.
Ware Paint Co.

BURR PICKERS.
Proctor & Schwartz, Inc.
Sargent's Sons, C. G.

BUSHINGS.
Southern Spindle & Flyer Co.

BUSINESS METHODS.
(See Consultants.)

CABINETS.
(See Lockers.)

CALCULATING MACHINES.
Monroe Calculating Mch. Co.

CALENDERS.
Butterworth & Sons Co., H. W.
Textile Finishing Mchry. Co.

CALENDER ROLLS.
(See Rolls—Calender.)

CALLING SYSTEM—INTERTELEPHONE.
Carter Electric Co.

CAMLESS DETACHING DEVICES.
Belger Co.

CAMPING EQUIPMENT, FURNITURE, STOVES, LIGHTS, ETC.
Smith Mfg. Co.

CANNING OUTFIT.
Home Canner Co.

CANS—ROVING.
National Vulcanized Fibre Co.
Standard Fibre Co.

CANS (DRYING).
(See Drying Equipment.)

CARS AND TRUCKS—FIBRE.
(See Trucks.)

CARDS (BUSINESS OR CALLING—ENGRAVED).
Wiggins Co., John B.

CARBONIZING MACHINERY.
Klauder-Weldon Dyeing Machine Co.
Macomb Machine Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons & Co., C. G.
Textile Finishing Mchry Co.
Tolhurst Mch. Works.

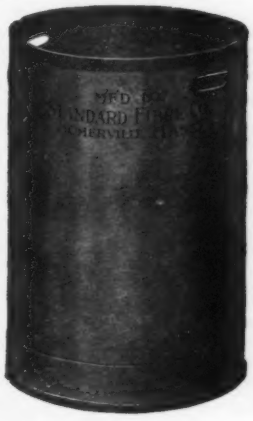
CARDING MACHINERY AND SUPPLIES.
Howard & Bullough.
Proctor & Schwartz, Inc.
Roy & Son, B. S.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

CARD CLOTHING.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

WRITE US
for catalog on
other
Mill Receptacles.

No-Waste

SEAMLESS ROVING CANS



Waste Baskets
Taper Baskets
Oval Cans
Elliptical Cans

Sizes
9"-10"-11"-12"-14"-18"
diameters
and
up to 45" high

NO
seams, joints,
or
Rivets.

Styles

Polished
Steel
or
Rolled Fibre
Top Rims
Rings
BEADED
securely
to
Hard Fibre
Shells.

Hard Fibre
MILL BARRELS
Plain Fibre
and
NEW PATTERN
Steel Clad
Trucks and Boxes
Combination
Doffing Cars

STANDARD FIBRE CO.
Somerville, Massachusetts

UPTOWN CHICAGO'S
MOST FAVORED HOTEL
500 ROOMS, EACH WITH PRIVATE BATH

Hotel
Sheridan-Plaza
CHICAGO
Sheridan Road at Wilson Avenue

Thousands who know the Chicago of today now prefer the large hotels of the North Shore. The beautiful new Sheridan Plaza is not only "Uptown Chicago's most favored hotel," but one of America's finest. Whether you come on business or for recreation, the Sheridan Plaza will please you. Music and dancing every evening. Moderate costs. Excellent Restaurant; Narcissus Grill cafeteria. Eighteen minutes from down-town; elevated express and surface lines; motor busses to and from downtown, through Lincoln Park, stop at the door. Exceptional garage accommodations.

European plan. Rooms, with private bath, $3.00 a day and up.
Reservations are advisable

BUYERS' INDEX—Continued.

CARD FEEDS.
Proctor & Schwartz, Inc.
Schofield Co., Wm.
Whitin Machine Co.

CARD GRINDING MACHINERY.
Proctor & Schwartz, Inc.
Roy & Son, B. S.
Whitin Machine Works.

CARPET MACHINERY.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Schofield, Wm., Co.
Textile Finishing Mchry Co.

CARRIER APRONS.
(See Aprons.)

CARRIER SYSTEM.
Euclid Crane & Hoist Co.
Curtis Pneumatic Machry. Co.
Wagner Mfg. Co.

CASES—WOODEN.
(See Packing Cases.)

CASTINGS.
Briggs, Schaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

CAUSTIC SODA.
(See Bleaching Materials.)

CEMENT REINFORCEMENT.
Birmingham Slag Co.
Truscon Steel Co.

CEMENT AND BRICK COATING.
American Cement Paint Co.
Detroit Graphite Co.
Cooledge & Sons, F. J.
Dixon Crucible Co., Jos.
St. Louis Surfacer & Paint Co.
Hockaday Co.
Sonneborn Sons, Inc., L.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

CENTRAL STATION (ELECTRIC).
Alabama Power Co.
Georgia Railway & Power Co.
Tennessee Electric Power Co.

CENTRIFUGALS.
Cresson-Morris Co.
Fletcher Works.
Goulds Mfg. Co.
Schaum & Uhlinger.
Tolhurst Mch. Wks.

CHAIN DRIVES.
(See Belting—Chain Link.)

CHAIN—BLOCK, BICYCLE, AUTO, ENGINE, AGRICULTURAL, ETC.
Fulton Supply Co.
Link Belt Co.
Morse Chain Co.
Renold, Inc., Hans.

CHAIRS AND STOOLS.
(See Furniture—Mill.)

CHECK STRAPS.
Bond Co., Chas.
Fulton Supply Co.
Hayes Loom Reed & Harness Co.
Jacobs Mfg. Co., E. H.

CHEMICALS.
(See Dyestuffs and Chemicals.)

CHLORINE GAS.
Electro Bleaching Gas Co.
Mathieson Alkali Works, Inc.

CLEANING AND AERATING MACHINE FOR COTTON.
Murray Company, The.

CLEARER CLOTH.
Philadelphia Felt Co.

CLOCKS—HANK, ETC.
(See Counters.)

CLOCKS (TIME).
Root Co.
Silberberg, Mortimer J.

CLOCKS—WATCHMAN.
Foxboro Co., Inc.
Root Co.

CLOSETS—WATER.
(See Toilets.)

CLOTH—ROLLER, CLEARER, SLASHER.
Philadelphia Felt Co.

CLOTH CUTTERS.
Firsching, J. A.
Foster Machine Co.
Wildman Mfg. Co.

CLOTH REELS.
Gallaudet Aircraft Corp.

CLOTH ROOM MACHINERY.
Butterworth, H. W., & Sons Co.
Firsching, J. A.
Foster Machine Co.
Hopedale Mfg. Co.
Saco-Lowell Shops.
Textile Finishing Mchry. Co.
Williams Co., J. H.
Wildman Mfg. Co.

CLOTH SHRINKING MACHINERY.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Tolhurst Mch. Wks.

CLOTH TESTERS.
Scott Co., Henry L.

CLOTH WINDERS.
(See Winders.)

CLUTCHES—FRICTION.
Allis-Chalmers Mfg. Co.
Carlyle-Johnson Machine Co.
Cresson-Morris Co.
Fulton Supply Co.
Link-Belt Company.
Mason, Velney W.

CLUTCH LININGS.
Carlyle-Johnson Mch. Co.

COAL AND ASH HANDLING MACHINERY.
Godfrey Conveyor Co.
Link-Belt Company.

COAL TAR DISINFECTANTS.
(See Disinfectants.)

COCKS.
(See Valves.)

COLOR PAILS.
(See Buckets—Mill.)

COMB APRONS.
(See Aprons.)

COMBERS AND COMBER SUPPLIES.
Belger Co.
Foster Machine Co.
U. S. Bobbin & Shuttle Co.
Whitin Machine Wks.

COMMISSION MERCHANTS & DEALERS.
(See Cotton Cloth Commission Merchants.)

COMPRESSORS—AIR, GAS, ETC.
Allis-Chalmers Mfg. Co.
Curtis Pneumatic Mchry Co.
Fulton Supply Co.
General Electric Co.
Goulds Mfg. Co.

COMMUTATOR BRUSHES.
(See Brushes—Motor and Generator.)

CONCRETE REINFORCEMENT.
Birminghara Slag Co.

CONDENSERS.
Allis-Chalmers Mfg. Co.

CONDUITS.
(See Elec. Machinery & Supplies.

CONE BELT TENSION DEVICE.
Bahan Textile Mch. Co.

CONE (KNITTING YARN).
Foster Mch. Co.

CONE WINDING MACHINE.
(See Winding Machinery.)

CONNECTORS—FRANKEL SOLDERLESS.
Westinghouse Elec. & Mfg. Co.

CONSULTANTS (BUSINESS METHODS).
Ernst & Ernst.

CONSULTING ENGINEERS.
(See Architects and Engineers)

CONTRACTORS AND ENGINEERS—BUILDING.
Dowman, George.
Dowman-Dozier Mfg. Co.
Sirrine & Co., J. E.
Stuhrman, Edw. A.
Truscon Steel Co.

CONTRACTORS—ELECTRICAL.
(See Electrical Engineers.)

CONTRACTORS (HEATING & PLUMBING).
Walker Electric & Plb. Co.

CONTROLLING INSTRUMENTS—TEMPERATURE.
Bristol Co.
Foxboro Co., Inc.
General Electric Co.
Taylor Instrument Co.

CONVEYORS—BELT.
(See Belt Conveyors.)

CONVEYING MACHINERY.
American Supply Co.
Chisholm-Moore Mfg. Co.
Collins, J. D.
Cresson-Morris Co.
Curtis Pneumatic Mchry. Co.
Dowman, George.
Euclid Crane & Hoist Co.
Fulton Supply Co.
Godfrey Conveyor Co.
Link-Belt Co.
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Renold, Hans.
Schofield, Wm. Co.
Wagner Mfg. Co.

CONVEYORS—PORTABLE.
Euclid Crane & Hoist Co.
Link-Belt Co.

COOLERS.
(See Humidifying Apparatus.)

COOLERS—WATER.
(See Water Coolers.)

COOLING AND CONDITIONING EQUIPMENT.
American Blower Co.
Buckeye Blower Co.
Sturtevant Co., B. F.

COOLING TOWERS.
(See Tanks and Towers.)

COPPER STAMPS AND STENCILS.
(See Stamps, Stencils, etc.)

CORDAGE MACHINERY.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

COST SYSTEMS.
Ernst & Ernst.

COTTAGES (READY BUILT).
Minter Homes Co.

COTTON CLEANING AND AERATING MACHINE.
Murray Company, The.

COTTON FANS.
(See Blowers.)

COTTON YARN AND CLOTH COMMISSION MERCHANTS AND DEALERS.
Aberfoyle Mfg. Co.
Anderson, Clayton & Co.
Boger & Crawford.
Callaway Mills.
Carver-Beaver Yarn Co., Inc.
Fawcett, Hughes
Florsheim, H. A.
Hunter Mfg. & Comm. Co.
Jamieson, J. B.
Lane & Co., J. H.
Weimar Bros.
Wellington, Sears & Co.
Woodward, Baldwin & Co.

COTTON MERCHANTS AND BROKERS
Beer & Co., H. & B.

COTTON MILL MACHINERY AND SUPPLIES.
American Blower Co.
Atlanta Harness & Reed Mfg. Co.
Auto Creel Corp.
Bahan Textile Mch. Co.
Barber-Colman Co.
Belger Co.
Butterworth & Sons, H. W.
Crompton & Knowles Loom Works.
Draper Corporation.
Dowman, George.
Dryer Corp. of America.
Durant Mfg. Co.
Eclipse Textile Devices, Inc.
Firsching Co., J. A.
Fletcher Works.
Foster Machine Co.
Foxboro Co., Inc.
Fulton Supply Co.
Gallaudet Aircraft Corp.
Greist Mfg. Co.
Hayes Loom Reed & Harness Co.
Hopedale Mfg. Co.
Howard Bros. Mfg. Co.
Howard & Bullough.
Hunt Machine Co., Rodney.
Hyatt Roller Bearing Co.
Jacobs Mfg. Co., E. H.
Lestershire Spool Mfg. Co.
Lowell Crayon Co.
Mill Devices Co.
Mossberg Pressed Steel Corp.
National Vulcanized Fibre Co.
Parker Co., Walter L.
Phila. Drying Mchry. Co.
Philadelphia Felt Co.
Proctor & Schwartz, Inc.
Root Co.
Roy & Son, B. S.
Sargent's Sons Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Stafford Co.
Steel Heddle Mfg. Co.
Sturtevant Co., B. F.
Suter, Alfred.
Terrell Machine Co.
Textile Finishing Machinery Co.
Textile Rubber Co.
Toledo Scale Co.
Tolhurst Mch. Wks.
Universal Winding Co.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.
Washburn & Sons, L. R.
Williams Co., J. H.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

COTTON TAPE LOOM.
Fletcher Works.
Foster Mch. Co.
Schaum & Uhlinger.

COTTON YARN MILLS.
(See Yarn Manufacturers.)

COUNTERS—REVOLUTION, HANK, PICK, ETC.
Bristol Co.
Durant Mfg. Co.
Foxboro Co.
Root Co.

COUNTERS—RESTAURANT.
(See Restaurant Equipment.)

COUPLING—SHAFT.
Cresson-Morris Co.
Dodge Mfg. Co.

COVERING—ROLLER.
Bond Co., Chas.
Philadelphia Felt Co.

CRANES.
(See Hoists.)

CRAYONS.
Lowell Crayon Co.

CREELS.
Auto Creel Corp.
Suter, Alfred.

CREOSOTED FLOORING, BLOCKS, POSTS, SHINGLES, ETC.
Southern Wood Preserving Co.

CUTS FOR PRINTING.
Jacobs & Co.

CUTTERS—CLOTH.
(See Cloth Cutters.)

CUTTERS—THREAD.
(See Thread Cutters.)

DEHUMIDIFIERS.
American Moistening Co.
Sturtevant Co., B. F.

DELIVERY CASES.
(See Boxes—Packing.)

DESKS—FACTORY.
Lupton's Sons Co., David.

DEXTRINES.
(See Dyestuffs and Chemicals.)

DIAL SCALES.
(See Scales.)

DIES—STEEL.
(See Stamps, Stencils, Etc.)

DIE STOCKS.
(See Pipe Threaders.)

DISINFECTANTS.
Barrett Co., The.

DOBBY CHAINS.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

DOBBY CARDS.
Jacobs & Co., E. H.

DOFFING BOXES—MILL.
(See Boxes—Mill.)

DOFFER FILLETS.
(See Fillets.)

DOFFING CARS.
(See Cars.)

DOORS—STEEL.
Dowman, George.
Dowman-Dozier Mfg. Co.
Lupton's Sons Co., David.
Variety Fire Door Co.

DRAWINGS AND ARTWORK.
Jacobs & Co.

DRAWING FRAMES.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

DRILLS—ELECTRIC.
(See Electric Machinery.)

DRINKING FOUNTAINS.
(See Fountains—Drinking.)

DROP WIRES.
Draper Corp.
Greist Mfg. Co.
Mossberg Pressed Steel Corp.
Steel Heddle Mfg. Co.
Williams Co., J. H.

DRYING APPARATUS.
American Blower Co.
Buckeye Blower Co.
Dryer Corp. of America.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sturtevant Co., B. F.

DRYING FORMS—HOSIERY.
Pearson, Jos. T.

DRYING MACHINERY AND EQUIPMENT.
American Blower Co.
American Laundry Mchry. Co.
Butterworth, H. W., & Sons Co.
Cocker Mch. & Fdry. Co.
Dryer Corp. of America.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Sturtevant Co., B. F.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.

DUST COLLECTORS.
(See Blowers and Blowing Systems.)

DUSTING MACHINERY.
Proctor & Schwartz, Inc.
Schofield Co., Wm.

DYERS, BLEACHERS AND FINISHERS.
American Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.
Franklin Process Co.

DYEING, BLEACHING, FINISHING AND PRINTING MACHINERY AND EQUIPMENT.
American Laundry Mchry. Co.
Brandwood, John.
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Cole Mfg. Co., R. D.
Dryer Corp. of America.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Franklin Process Co.
Hunt Machine Co., Rodney.
Klauder-Weldon Dyeing Mch. Co.
Macomb Machine Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.
Woolford Wood Tank Co., G.

DYEING MACHINES (PACKAGE AND SPOOL).
Brandwood, John.
Franklin Process Co.

DYE BAGS OR NETS.
Smith Mfg. Co.

DYE STICKS.
Phila. Drying Machinery Co.

DYE VATS AND TUBS.
(See Tanks or Bleaching Kiers.)

Pat. Applied for

SPUR-CAP SHELLS

Made to Stand the Hard Knocks

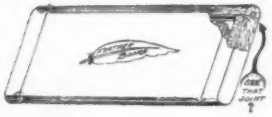
MANUFACTURED BY

GALLAUDET AIRCRAFT CORP'N.,

EAST GREENWICH, R. I.

FEATHERBOARD

The Master Cloth Reel



LIGHT AND STRONG. IMPROVES YOUR PUT UP.

"ATLANTA" HARNESS

"Quality and Service That Satisfies"

ATLANTA HARNESS & REED MFG. CO.

ATLANTA, GA.
P. O. Box 1375
Telephone Main 0517

Schofield Patent Automatic Opener and Duster

For opening and dusting Wool, Cotton, Linters, Hair and kindred fibrous substances.

"Schofield" intermediate feeds for Cards, Wool, Rag, Waste, Hair and Lumper Pickers, Automatic, Cone and Oldham Willows, Rag and Extract Dusters, Waste Pullers, Blamaine Lap Feeds, Curled Hair Pickers, Needle Looms, etc.

WILLIAM SCHOFIELD COMPANY

Iron Founders, Textile Machinery Builders.
Krams Ave., Manayunk, Philadelphia, Pa.

Shafts, Pulleys, Hangers, Belting Packing, Lacing

BOILERS

For Mills and Public Works. Low Prices

Tanks, Stacks, Smoke Flues, Boiler Tubes, Pipe, Valves, Fittings, Kerosene and Gasoline Engines, Wood Saws, Pumps, Heaters, Injectors, Engine Supplies and Repairs for Mills, Hotels, Public Works.

Iron and Brass Castings Cast Every Day.

LOMBARD Foundry, Machine, Boiler Works, and Supply Store
AUGUSTA, GEORGIA

Not Only

Your Dye tubs
But your storage
Tanks and Towers
should be estimated
upon by us—

Ask for Bulletin A and D.

G. WOOLFORD WOOD TANK MANUFACTURING COMPANY
Lincoln Bldg. Philadelphia, Pa.

ALL STEEL **ECONOMY** FIRE PROOF **BALING PRESSES**
ALL SIZES FOR ALL PURPOSES
LARGEST LINE BUILT IN U.S.A.
ECONOMY BALER CO., DEPT C ANN ARBOR, MICH., U.S.A.

WATER

WE-FU-GO AND SCAIFE
PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES
WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.

BUYERS' INDEX—Continued.

DYESTUFFS AND CHEMICALS.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Central Dyestuff & Chemical Co.
Ciba Co., Inc.
Electro Bleaching Gas Co.
Ford Co., J. B.
Grasselli Chemical Co.
India Alkali Works.
Kali Mfg. Co.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Metz & Co., H. A.
National Aniline & Chemical Co.
Quaker City Chemical Co.
Roessler & Hasslacher Chemical Co.
New Brunswick Chemical Co.
Pennick & Ford, Ltd.
Rohm & Haas Co.
Sandoz Chemical Co.
Sonneborn Sons, Inc., L.
Staley Mfg. Co., A. E.
Stein, Hall & Co.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques.

ELECTRIC CONDUIT AND FITTINGS.
(See Electrical Machinery and Supplies.)

ELECTRIC DYNAMOS AND MOTORS.
(See Motors and Generators.)

ELECTRIC FANS.
(See Fans—Electric.)

ELECTRIC LAMPS.
(See Lamps.)

ELECTRIC LAMP GUARDS.
Ivanhoe Regent Works.
Perry-Mann Electric Co.
Southern Elec. Supply Co.

ELECTRICAL ENGINEERS AND CONTRACTORS.
American Industries Eng'g Co.
Curtis Co., The.
Huntington & Guerry, Inc.
Panton, Harrison D.
Perry-Mann Electric Co.
Standard Electric Co.
Walker Elec. & Plbg. Co.

ELECTRIC LIGHTING ENGINEERS.
(See Illuminating Engineers.)

ELECTRICAL MACHINERY, INSTRUMENTS AND SUPPLIES.
Allis-Chalmers Mfg. Co.
American Blower Co.
Blake Electric Mfg. Co.
Bristol Co.
Carter Electric Co.
Cooper Hewitt Electric Co.
Curtis Co., The.
Cutler Works, George.
Euclid Crane & Hoist Co.
Fulton Supply Co.
General Electric Co.
Ivanhoe-Regent Works.
Perry-Mann Electric Co.
Seawell, Luke.
Southern Elec. Supply Co.
Standard Electric Co.
Sturtevant Co. B. F.
Walker Electric & Plbg. Co.
Walsh & Weidner Boiler Co.
Westinghouse Elec. & Mfg. Co.

ELECTRIC POWER.
(See Power.)

ELECTRIC PRESSES (HIGH-PRESSURE).
Rex Eng'g Corp.

ELECTRIC TRACTORS AND TRUCKS.
(See Tractors and Trucks—Electric.)

ELECTROTYPES.
Jacobs & Co.

ELEVATORS—PORTABLE.
Collins, J. D.
Euclid Crane & Hoist Co.

ELEVATORS.
Link-Belt Company.

ENAMELED IRON AND GLASS FOR TEXTILE MACHRY.
Mitchell-Bissell Co.

ENAMEL—MILL WHITE.
(See Paint.)

ENGINEERS—MILL.
(See Architects.)

ENGINES—OIL, GAS AND GASOLINE.
Allis-Chalmers Mfg. Co.
Fulton Supply Co.

ENGINES (STEAM).
Allis-Chalmers Mfg. Co.
American Blower Co.
Cole Mfg. Co., R. D.
Fulton Supply Co.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Toomey, Frank.

ENGINE ROOM APPLIANCES AND SUPPLIES.
American Blower Co.
Casey-Hedges Co.
Crane Co.
Fulton Supply Co.
Jenkins Bros.
Lunkenheimer Co.
Westinghouse Elec. & Mfg. Co.

ENGINEERS (CONSULTANT AND EFFICIENCY).
Ernst & Ernst.

ENGINEERS (TEXTILE AND MECHANICAL CONSULTING).
Panton, Harrison D.

ENGINEERS (INDUSTRIAL, CIVIL, CHEMICAL, TEXTILE, ARCHITECTURAL, ELECTRICAL).
American Industrie, Eng'g Co.

ENGRAVING AND CUTS.
Jacobs & Co.

ETCHING—(PRINTING).
Jacobs & Co.

EXHAUSTERS.
(See Blowers.)

EXPORTERS—COTTON.
(See Brokers.)

EXTRACTORS—HYDRO.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

FACTORY DESKS.
Lupton's Sons Co., David.

FACTORY AND INDUSTRIAL SITES.
(See Industrial Sites.)

FACTORY MANAGEMENT SYSTEMS.
Ernst & Ernst.

FANS—ELECTRIC.
American Blower Co.
Buckeye Blower Co.
Carter Electric Co.
General Electric Co.
Perry-Mann Electric Co.
Southern Electric Supply Co.
Westinghouse Elec. & Mfg. Co.

FANS—CONVEYING, POWER AND EXHAUST.
(See Blowers and Blowing Systems.)

FASTENERS—BELT.
(See Belt Fasteners.)

FEED WATER PURIFIERS.
(See Boiler Feed Water Purification.)

FEEDERS.
(See Automatic Feeders.)

FELT CLOTH FOR ROLLS.
Philadelphia Felt Co.

FELTING MACHINERY.
Proctor & Schwartz, Inc.

FENCE—STEEL AND IRON.
Cyclone Fence Co.
Dowman, George.
Anchor Post Iron Works.
Knapp Fence Co.

FENCE POSTS—CREOSOTED PINE.
Southern Wood Preserving Co.

FIBRE PRODUCTS.
National Vulcanized Fibre Co.
Standard Fibre Co.

FILLETS (DOFFER, CYLINDER, STRIPPER AND BURNISHING).
Howard Bros. Mfg. Co.

FILLING—CAP AND WARP.
U. S. Bobbin & Shuttle Co.

FILTERS—WATER.
American Water Softener Co.
Norwood Engineering Co.
Scaife & Sons Co., Wm. B.

FILTERS—OIL REMOVAL.
Norwood Engineering Co.

FILTERS (ALUM).
Lennig & Co., Chas.

FILTER CLOTHS
Smith Mfg. Co.

FINISHING.
(See Dyers, Bleachers and Finishers.)

FINISHING, BLEACHING AND SIZING MATERIALS.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Central Dyestuff & Chemical Co.
Ciba Co., Inc.
Corn Products Refining Co.
Electro Bleaching Gas Co.
Ford Co., J. B.
India Alkali Works.
Kali Mfg. Co.
Keever Starch Co.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Metz & Co., H. A.
National Aniline & Chemical Co.
Roessler & Hasslacher Co.
New Brunswick Chemical Co.
Pennick & Ford, Ltd.
Quaker City Chemical Co.
Rohm & Haas Co.
Sandoz Chemical Co.
Sonneborn Sons, Inc., L.
Staley Mfg. Co., A. E.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

FIRE DOORS AND HARDWARE.
Bogert & Carlough.
Dowman-Dosier Mfg. Co.
Dowman, George.
Lupton Sons Co., David.
Sanymetal Products Co.
Truscon Steel Co.
Variety Fire Door Co.

FIRE HOSE.
(See Hose—Fire.)

FIRE PROTECTING PAINT.
(See Paint.)

FLAX SPINNING.
U. S. Bobbin & Shuttle Co.

FLEXIBLE COUPLINGS.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.

FLOOD LIGHTS—ELECTRIC.
Cooper Hewitt Electric Co.
Cutler Works, George.
Ivanhoe Regent Works.
General Electric Co.
Perry-Mann Electric Co.
Southern Electric Supply Co.

FLOORING LUMBER.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

FLOORING—WOOD BLOCKS.
Southern Wood Preserving Co.

FLOOR SCRUBBING MACHINE
American Scrubbing Equipment Co.

FLOOR SCRUBBING POWDERS.
(See Scrubbing Powders.)

FLOOR SWEEPS.
(See Brushes.)

FLUTED ROLLS.
Howard & Bullough.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield & Sons, J. S.
Southern Spindle & Flyer Co.
Whitin Machine Works.

FLYERS.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

FOUNDERS.
Briggs-Schaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdy. & Mch. Wks.

FOUNTAINS—DRINKING.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

FRICTION CLUTCHES.
(See Clutches—Friction.)

FUEL ECONOMIZERS.
Sturtevant Co., B. F.

FURNITURE (FOLDING—CAMP)
Smith Mfg. Co.

FURNITURE—MILL.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Royal Metal Mfg. Co.
Sanymetal Products Co.
Smith Mfg. Co.

FUSES—ELECTRIC.
Carter Electric Co.
Fulton Supply Co.
Perry-Mann Electric Co.
Seawell, Luke.
Southern Electric Supply Co.

GARAGES (PORTABLE—METAL).
Dowman, George.
Dowman-Dosier Mfg. Co.
Maryland Metal Bldg. Co.

GARNETT MACHINES.
Proctor & Schwartz, Inc.

GAS ENGINES.
(See Engines—Gas.)

GASOLINE LIGHTING SYSTEMS, LANTERNS, ETC.
Smith Mfg. Co.

GASOLINE CAMP STOVES.
Smith Mfg. Co.

GAUGES—STEAM PRESSURE, ETC.
Bristol Co.
Fulton Supply Co.
Foxboro Co., Inc.
Taylor Instrument Co.

GAUGE—OIL.
Fulton Supply Co.
Lunkenheimer Co.

GAUGES (LIQUID LEVEL).
Foxboro Co., Inc., The.
Taylor Inst. Co.

GAUGES—WATER.
Fulton Supply Co.
Lunkenheimer Co.

GEARS—SILENT.
Dodge Mfg. Co.
Fulton Supply Co.
General Electric Co.
Link-Belt Company.
Morse Chain Co.
Renold, Hans.

GEAR CUTTING AND CUTTERS.
Cresson-Morris Co.

GEAR PULLERS.
General Electric Co.

GENERATORS—ELECTRIC.
(See Motors and Generators.)

GLASSWARE AND DISHES.
(See Dishes.)

GOVERNORS—PUMP.
General Electric Co.

GRAPHIC CHARTS.
Ernst & Ernst.

GRAPHITE.
Detroit Graphite Co.
Dixon Crucible Co., Jos.

GRATES—BOILER.
Casey-Hedges Co.
Cole Mfg. Co., R. D.
International Eng. Works.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

GRATES—MECHANICAL.
(See Stokers.)

GREASE.
(See Lubricants.)

GREASE CUPS.
(See Lubricators.)

GRINDER—CARD, CYLINDER, ROLL, NAPPER AND GARNET.
(See Card Grinding Machinery.)

GUARDS—ELECTRIC LAMP.
(See Electric Lamp Guards.)

GUARDS—MACHINE, SKYLIGHT, WINDOW, ETC.
Anchor Post Iron Works.
Dowman, George.
Knapp Fence Co.

GUIDES—THREAD.
Mitchell-Bissell Co.
Palmer Co., I. E.

GUMS.
(See Finishing and Sizing Materials.)

HALFTONES—PRINTING.
Jacobs & Co.

HANGERS.
(See Shafting and Hangers.)

HANK CLOCKS.
(See Counters.)

HARDWARE—BUILDING.
Dowman, George.
Dowman-Dosier Mfg. Co.
Sanymetal Products Co.
Wagner Mfg. Co.

HARNESS—LOOM.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Crompton & Knowles Loom Works.
Emmons Loom Harness Co.
Greist Mfg. Co.
Garland Mfg. Co.
Hayes Loom Reed & Harness Co.

HEADS—BOBBIN AND SPOOL.
Lestershire Spool & Bobbin Co.
Parker Co., Walter L.
U. S. Bobbin & Shuttle Co.

HEATING AND VENTILATING APPARATUS.
(See Ventilating Apparatus.)

HEATING & PLUMBING CONTRACTORS.
Walker Electric & Plbg. Co.

HEDDLES.
Crompton & Knowles Loom Works.
Draper Corporation.
Howard Bros. Mfg. Co.
Steel Heddle Mfg. Co.
Williams Co., J. H.

HEDDLE FRAMES.
Crompton & Knowles Loom Works.
Steel Heddle Mfg. Co.
Williams Co., J. H.

HOISTS.
Chisholm Moore Mfg. Co.
Curtis Pneumatic Mchry Co.
Euclid Crane & Hoist Co.
Fulton Supply Co.
Link-Belt Company.
Morse Chain Co.

HOPPER FEEDERS.
(See Automatic Feeders.)

HORNS AND MUSICAL INSTRUMENT.
Cable Piano Co.
Conn, Ltd., C. G.

HOSE—FIRE.
Collins, J. D.

HOSIERY DYEING MACHINERY.
Cole Mfg. Co., R. D.
Franklin Process Co.
Philadelphia Drying Mchry. Co.

HOSIERY FORMS.
(See Drying Forms.)

HOSIERY YARNS.
(See Yarn Manufacturers.)

HOTELS.
Hotel Sheridan Plaza.
Hotel Madison Square.
Hotel Martinique.
Hotel Tuller.

HOUSES AND MILL COTTAGES (READY BUILT).
Minter Homes Co.

HUMIDIFYING APPARATUS.
American Blower Co.
American Moistening Co.
Carrier Eng. Corp.
Parks-Cramer Co.
Sturtevant Co., B. F.

HUMIDIFYING INDICATING INSTRUMENTS.
Bristol Co.
Foxboro Co., Inc., The.
Taylor Instrument Co.

HUMIDITY RECORDERS.
Foxboro Co., Inc., The.

HYDRODEIKS.
Taylor Instrument Co.

HYGROMETERS.
Foxboro Co.
Taylor Instrument Co.

HYDRAULIC TURBINES.
(See Turbines—Hydraulic.)

HYDRO EXTRACTORS.
(See Extractors.)

ILLUMINATING ENGINEERS.
Cooper Hewitt Electric Co.
Curtis Co., The.
Huntington & Guerry.
Panton, Harrison D.
Ivanhoe-Regent Works.
Walker Elec. & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

INDICATING AND RECORDING INSTRUMENTS AND THERMOMETERS.
Bristol Co.
Durant Mfg. Co.
Foxboro Co., Inc.
General Electric Co.
Root Co.
Taylor Instrument Co.

INDIGO.
(See Dyestuffs and Chemicals.)

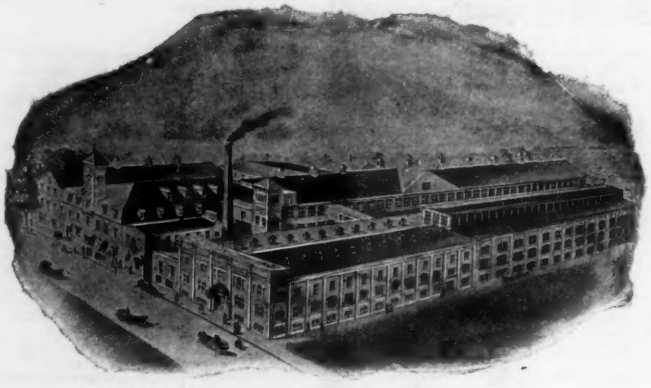
INDUSTRIAL SITES.
Alabama Power Co.
Georgia Ry. & Power Co.
Nashville Industrial Corp.
Tennessee Electric Power Co.

INJECTORS.
Lunkenheimer Co.

INK—STENCIL AND MARKING.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

INSURANCE.
Prudential Insurance Co.

IRON WORK—ORNAMENTAL.
American Fence Const. Co.
Anchor Post Iron Works.
Cyclone Fence Co.
Dowman, George.
Dufur & Co.



Let Us Fill Your Requirements for

COTTON HARNESS, MAIL HARNESS, SELVEDGE HARNESS, REEDS, SLASHER AND STRIKING COMBS, WARPER AND LIECE REEDS, BEAMER AND DRESSER HECKS, MENDING EYES, JACQUARD HEDDLES, ETC.

Satisfaction Assured

You are assured of complete satisfaction in all your dealings with us.
The quality of our products and the service we render are alone responsible for our growth. Emmons Quality Loom Harness and Reeds have retained every old customer and gained new customers year after year.

Write us for estimates on your needs.

EMMONS LOOM HARNESS CO., LAWRENCE, MASS.
SOLE AGENTS FOR WARDWELL PICKERS
The Largest Manufacturers of Loom Harness and Reeds in America
Southern Representative: Geo. F. Bahan.

EMMONS LOOM HARNESS AND REEDS

ELECTRIC WIRING CONTRACTOR

LIGHT POWER

THE CURTIS CO.
Chattanooga, Tenn.
TEXTILE WORK A SPECIALTY

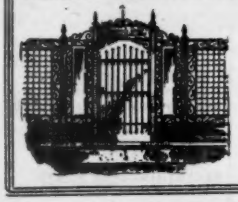
HARRISON D. PANTON, E. E.

Consulting Engineer

Electrical Textile Mechanical

Design, Consultation, Tests, Investigations, Appraisals, and Reports.

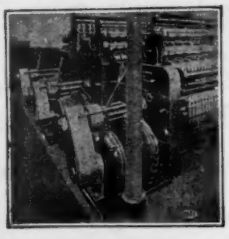
GILMER BLDG. RALEIGH, N. C.



WIRE RAILINGS
WINDOW GUARDS
WIRE CLOTH
Established 1835.
DUFUR & CO.
309 N. Howard St. Baltimore, Md.

WELLS

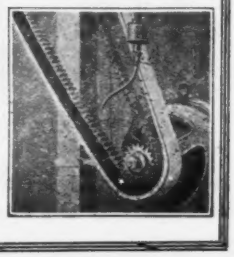
HUGHES SPECIALTY WELL DRILLING CO
CHARLESTON ATLANTA
Established 1885



RENOLD CHAINS

For Power Transmission

Montreal HANS RENOLD INC., *Toronto*
365 Broadway, N. Y.



BUYERS' INDEX—Continued.

Knapp Fence Co.
Lombard Iron Works & Supply Co.

JACK SPOOLS.
(See Spools.)

JACQUARDS.
Crompton & Knowles Loom Works.

JOINT COMPOUND.
Dixon Crucible Co., Jos.

JUTE BAGGING MACHINE.
Proctor & Schwartz, Inc.

KETTLES—SIZE.
(See Size Kettles.)

KETTLES—SODA.
Lombard Iron Works & Supply Co.

KIERS.
(See Bleaching Kiers.)

KNIT GOODS.
(See Cotton Cloth Commission Merchants and Dealers.)

KNIT GOODS WASHERS.
(See Washers—Cloth.)

KNITTING MACHINERY AND SUPPLIES.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Scott & Williams.
Torrington Co.
Trump Bros. Machine Co.
Wildman Mfg. Co.

KNITTING NEEDLES.
Torrington Co.

KNOTTERS.
Barber-Colman Co.
Mill Devices Co.

LABORATORY INSTRUMENTS.
Bristol Co.
Scott & Co., Henry L.
Foxboro Co., Inc.
Root Co.
Taylor Instrument Co.

LACING—BELT.
(See Belt Lacing.)

LAMPS—INCANDESCENT AND ARC.
Carter Electric Co.
Cooper Hewitt Electric Co.
Curtis Co., The.
Cutter Works, George.
General Electric Co.
Ivanhoe-Regent Works of G. E. Co.
Perry-Mann Electric Co.
Seawell, Luke.
Southern Electric Supply Co.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

LAMP GUARDS—KEY LOCKING.
(See Electric Lamp Guards.)

LAMP REFLECTORS.
Carter Electric Co.
Cooper Hewitt Electric Co.
Curtis Co., The.
Cutter Works, George.
Ivanhoe-Regent Works of G. E. Co.
Perry-Mann Electric Co.
Southern Electric Supply Co.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

LANDSCAPE ARCHITECTS.
(See Village Architects.)

LAPPERS.
Saco-Lowell Shops.
Whitin Machine Works.

LATHES.
Fulton Supply Co.

LAUNDRY BAGS, BASKETS, & NETS.
Smith Mfg. Co.

LAUNDRY MACHINERY.
American Laundry Mchry. Co.
Fletcher Works.
Hunt Machine Co., Rodney.
Schaum & Uhlinger.
Tolhurst Machine Works.

LAVATORIES.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Vogel Co., Jos. A.

LEATHER BELTING.
(See Belting.)

LEATHER SPECIALTIES.
American Supply Co.
Bond Co., Chas.
Graton & Knight Mfg. Co.
Jacobs Mfg. Co., E. H.
Williams & Sons, I. B.

LIGHTS—FLOOD.
(See Flood Lights.)

LIGHTING ENGINEERS AND CONTRACTORS.
(See Illuminating Engineers.)

LINEN YARNS.
(See Yarns Linen.)

LINK BELTING.
(See Belting—Link.)

LINTERS.
(See Waste Dealers.)

LIQUID CHLORINE.
(See Chlorine.)

LOADERS—WAGON AND TRUCK.
Link-Belt Company.

LOCKERS—METAL.
Collins, J. D.
Dowman, George.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Sanymetal Products Co.

LOGWOOD EXTRACT.
(See Dyestuffs and Chemicals.)

LOOMS.
Crompton & Knowles Loom Works.
Draper Corporation.
Fletcher Works.
Hopedale Mfg. Co.
Saco-Lowell Shops.
Schaum & Uhlinger.
Stafford Co.

LOOM ATTACHMENTS—AUTOMATIC.
Draper Corporation.
Hopedale Mfg. Co.

LOOM HARNESS.
(See Harness.)

LOOP PICKERS.
Jacobs Mfg. Co., E. H.

LUBRICANTS.
Dixon Crucible Co., Jos.
N. Y. & N. J. Lubricant Co.
Texas Co.

LUBRICATORS.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.

LUG STRAPS.
(See Straps—Lug.)

LUMBER.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

LUNCH ROOM EQUIPMENT.
(See Restaurant.)

MACHINE GUARDS.
(See Guards—Machine.)

MACHINE TOOLS.
(See Tools.)

MACHINISTS.
Briggs-Schaffner Co.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Lombard Fdry. & Mch. Wks.

MARKING POTS, STENCILS, INKS, ETC.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.

MERCERIZED YARNS.
(See Yarn Manufacturers.)

MERCERIZERS.
Aberfoyle Mfg. Co.
Amer. Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.

MERCERIZED YARN.
Aberfoyle Mfg. Co.
American Yarn & Pro. Co.
Boger & Crawford Co.
Dixie Mercerizing Co.
Hunter Mfg. & Comm. Co.

MERCERIZING MACHINERY.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

METAL CEILINGS, ETC.
Dowman, George.
Dowman-Dozier Mfg. Co.
Lupton's Sons Co., David.
Truscon Steel Co.

METAL SIDING.
Dowman, George.
Dowman-Dozier Mfg. Co.

METALS—PERFORATED.
(See Screens and Sieves.)

METAL WORKS (SHEET).
Dowman-Dozier Mfg. Co.

METERS—FLOW, AIR, GAS, ELECTRIC, STEAM, ETC.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
Foxboro Co., Inc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

METERS—COUNTING.
(See Counters.)

MILL BASKETS AND BOXES.
(See Boxes—Mill.)

MILL ENGINEER.
(See Architects and Engineers.)

MILL VILLAGES.
(See Villages.)

MILL SUPPLIES—MISCELLANEOUS.
(See Supplies—Mill.)

MILL WHITE PAINT.
(See Paint.)

MOPS.
Atlanta Brush Co.
Southwestern Broom Mfg. Co.

MOTION PICTURES.
(See Films.)

MOTORS AND GENERATORS—ELECTRIC.
Allis-Chalmers Mfg. Co.
American Blower Co.
Carter Electric Co.
Curtis Co., The.
Fulton Supply Co.
General Electric Co.
Nashville Industrial Corp.
Perry-Man Electric Co.
Southern Electric Supply Co.
Standard Electric Co.
Sturtevant Co., B. F.
Walker Electric & Plbg. Co.
Westinghouse Elec. & Mfg. Co.

MOVING PICTURE MCH. AND SUPPLIES.
(See Theatre Equipment.)

NAPPER CLOTHING.
Philadelphia Felt Co.

NAPPER ROLL GRINDING MACHINES.
(See Card Grinders.)

MUSICAL INSTRUMENTS.
Cable Piano Co.
Conn, Ltd., C. G.

NEEDLES—KNITTING.
Torrington Co.

OFFICE EQUIPMENT & SUPPLIES.
Atlanta Stamp & Stencil Wks.
Dixie Seal & Stamp Co.
Jacobs & Co.
Knapp Fence Co.
Lupton's Sons Co., David.
Monroe Calculating Mch. Co.
Smith & Bros. Typewriter Co.
Sanymetal Products Co.

OFFICE PARTITIONS.
(See Partitions.)

OIL—LUBRICATING.
Johnson & Co., Inc., Oliver.
N. Y. & N. J. Lubricant Co.
Texas Co.
Wadsworth, Howland & Co., Inc.

OIL ENGINES.
(See Engines Oil.)

OILS—FINISHING.
(See Finishing and Sizing Materials.)

OIL CUPS.
(See Lubricants.)

OIL PAPER.
Bradley Mfg. Co., A. J.

OIL SEPARATORS.
(See Separators.)

OILING DEVICES.
(See Lubricators.)

OPENING MACHINERY—COTTON, WOOL, WASTE, ETC.
Murray Company, The.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

OVERHEAD CARRIERS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Mchry Co.
Dowman, George.
Euclid Crane & Hoist Co.
Wagner Mfg. Co.

OXIDIZING MACHINERY.
Phila. Drying Machinery Co.

OXYGEN.
Oxweld Acetylene Co.
Standard Gas Products Co.

PACKING BOXES AND CASES—WOODEN.
Lewis Co., G. B.

PACKINGS.
Jenkins Bros.

PAINT.
American Cement Paint Co.
Barrett Co., The.
Cooledge & Sons, F. J.
Detroit Graphite Co.
DeVilbiss Mfg. Co.
Dixon Crucible Co., Jos.
Hockaday Co.
Johnson & Co., Oliver.
Sonneborn Sons, Inc., L.
St. Louis Surfacer & Paint Co.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

PAINT SPRAYING EQUIPMENT.
DeVilbiss Mfg. Co.

PAINTING CONTRACTORS.
(See Contractors.)

PANEL BOARD.
(See Switchboards.)

PAPER.
Bradley Mfg. Co., A. J.

PARTITIONS—STEEL AND WIRE.
Cyclone Fence Co.
Dowman, George.
Dowman-Dozier Mfg. Co.
Anchor Post Iron Works.
Knapp Fence Co.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturers Equip. & Eng'g Co.
Sanymetal Products Co.

PAVING BRICKS.
National Paving Brick Mfg. Asso.

PERBORATE OF SODA.
Roessler & Hasslacher Chemical Co.

PERFORATED METAL.
(See Screens and Sieves.)

PEROXIDES.
Roessler & Hasslacher Chemical Co.

PICK COUNTERS.
(See Counters.)

PICKERS—CURLED HAIR.
Proctor & Schwartz, Inc.
Schofield Co., Wm.

PICKERS—LEATHER.
Bond Co., Chas.
Garland Mfg. Co.
Jacobs Mfg. Co., E. H.

PICKER LOOPS.
Jacobs Mfg. Co., E. H.

PICKER BAGS.
Smith Mfg. Co.

PICKER CONE BELT TENSION DEVICE.
Bahan Textile Mch. Co.

PICKER STICKS.
Garland Mfg. Co.

PICKING MACHINERY.
Howard & Bullough Am. Machine Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

PINIONS.
General Electric Co.

PIPE—STEEL RIVETED.
Fulton Supply Co.
Youngstown Sheet & Tube Co.

PIPE AND PIPE FITTINGS.
Crane Co.
Fulton Supply Co.
Lunkenheimer Co.
Parks-Cramer Co.
Scaife & Sons Co., Wm. B.
Walker Electric & Plbg. Co.

PIPE JOINT COMPOUND.
Dixon Crucible Co., Jos.
Fulton Supply Co.

PIPING—COTTON.
Youngstown Sheet & Tube Co.

PIPING ENGINEERS.
Walker Electric & Plbg. Co.

PIPE BENDING.
Youngstown Sheet & Tube Co.

PLAYGROUND APPARATUS & EQUIPMENT.
Crane Co.
Everwear Mfg. Co.
Hill Standard Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

PLUMBING AND HEATING CONTRACTORS.
Walker Electric & Plbg. Co.

PNEUMATIC COLLECTING & CONVEYING SYSTEMS.
Sturtevant Co., B. F.

PNEUMATIC MACHINERY & TOOLS.
Curtis Pneumatic Mchry. Co.

PORCELAIN GUIDES.
Mitchell-Bissell Co.

PORTABLE HOUSES AND GARAGES (STEEL).
Dowman, George.
Dowman-Dozier Mfg. Co.
Maryland Metal Bldg. Co.

PORTABLE CONVEYORS.
(See Conveyors.)

POSTS—FENCE (WOOD).
Southern Wood Preserving Co.

POWER—ELECTRIC.
Alabama Power Co.
Georgia Ry. & Power Co.
Tennessee Electric Power Co.

POWER TRANSMISSION EQUIPMENT.
Aldrich Machine Works.
Allis-Chalmers Mfg. Co.
Bond Co., Chas.
Bristol Co.
Carlyle-Johnson Mch. Co.
Cresson-Morris Co.
Clipper Belt Lacer Co.
Detroit Belt Lacer Co.
Dixon Crucible Co., Jos.
Dodge Mfg. Co.
Fafnir Bearing Co.
Fulton Supply Co.
General Electric Co.
Graton & Knight Mfg. Co.
Hyatt Roller Bearing Co.
Link-Belt Company.
Morse Chain Co.
Renold, Inc., Hans.
Rhoads & Sons, J. E.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.

PRESERVATIVE PAINT FOR METAL WORK.
(See Paints.)

PRESSED STEEL.
Lupton's Sons Co., David.

PRESSES.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Economy Baler Co.
Logemann Bros. Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Rex Eng'g Corp.
Textile Finishing Machinery Co., The.

PRESSURE GAUGES.
(See Gauges.)

PRESSURE GAUGES.
(See Gauges.)

PRESSURE REGULATORS.
(See Regulators—Pressure.)

PRINTERS (CLOTH).
(See Dyers.)

PRINTING.
Jacobs & Co.
Showalter Printing Co., A. J.

PRINTING EXTRACTORS—HYDRO.
Tolhurst Machine Works.

PROPELLER FANS.
(See Blowers.)

PSYCHROMETERS.
Bristol Co.
Foxboro Co., Inc., The.

PULLEYS.
Cole Mfg. Co., R. D.
Cresson-Morris Co.
Dodge Mfg. Co.
Fulton Supply Co.
Link-Belt Company.
Renold, Inc., Hans.

PULLEY COVERING.
Williams & Sons, I. B.

PUMPS.
Allis-Chalmers Mfg. Co.
Fulton Supply Co.
Goulds Mfg. Co.
Sydnor Pump & Well Co., Inc.
Toomey, Frank.
Walsh & Weidner Boiler Co., The.
Westinghouse Elec. & Mfg. Co.

PUMPS—OIL.
Lunkenheimer Co.

PUMP VALVES.
(See Valve Discs.)

PYROMETERS.
Bristol Co.
Foxboro Co.
Taylor Instrument Co.

QUILLS.
Jordan Mfg. Co.
U. S. Bobbin & Shuttle Co.

QUILL CLEANING MACHINES.
Terrell Machine Co.
Southern Railway System.

RAW STOCK DRYING SYSTEMS.
Brandwood, John.

RECEPTACLES—FIBRE.
(See Fibre Products.)

RECLOTHING TOP FLATS.
Howard Bros. Mfg. Co.

RECORDING INSTRUMENTS.
Bristol Co.
Durant Mfg. Co.
Foxboro Co., Inc.
General Electric Co.
Taylor Instrument Co.

REEDS.
American Supply Co.
Atlanta Harness & Reed Mfg. Co.
Emmons Loom Harness Co.
Hayes Loom Reed & Harness Co.

REELS.
Crompton & Knowles Loom Works.
Draper Corporation.

"Cement for Permanence—Why not Zemcolite ?"

Zemco-lite
TRADE MARK

"The Cement Paint"

Never Discolors
Sticks and Stays
Will Not Peel, Crack or Blister
Properly Diffuses Light

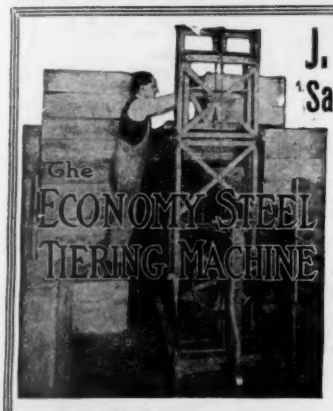
ZEMCOLITE is the ideal and economical paint for the walls of cotton mills. Climate has no effect on it.

A Zemco-lite wall is a pure white semi-flat finish which stays white, never discoloring and because of its wonderful light refracting properties it renders a perfectly lighted interior free from glare.

There are many interesting details about "ZEMCO-LITE" —Write us for information. Put your paint problems up to us, we can show you some close figuring.

American Cement Paint Co.

Chattanooga, Tennessee



J. D. Collins Sales & Eng'g. Co.

STORAGE AND INDOOR TRANSPORTATION EQUIPMENT
55½ Luckie St.
Atlanta, Ga.

Equipment that will reduce your storage and handling expenses. Tiering Machines, Electric and Hand Trucks, Overhead Carriers, Gravity and Power Conveyors of all kinds.

Catalogs and full information furnished upon request

COTTON MILL REPAIRS

SEND SAMPLES OF PARTS WANTED AND GET OUR PRICES. YOU DON'T HAVE TO BUY.

WE WILL SAVE YOU TIME

AND WON'T EXPECT YOUR ORDER IF WE CAN'T

SAVE YOU SOME MONEY TOO

Briggs-Shaffner Company

WINSTON-SALEM, N. C.

MACHINE WORK FOUNDRY WORK

LAMPS! LAMPS!

Manufacturers Licensed Under G. E. Patents

FUSES, FUSE PLUGS, SOCKETS, ETC.

GET PRICES AND DISCOUNTS

LUKE SEAWELL, Distributor

420 AUSTELL BUILDING ATLANTA, GA.

SOUTHERN ELECTRIC SUPPLY CO.

DISTRIBUTORS

81 Marietta St. Atlanta, Ga.

COMPLETE line electrical supplies for every purpose, including Buckeye Mazda Lamps, Emerson Fans, safety switches, fuses, wires, cables, conduit and fittings, etc.

Send us your inquiries.

Quotations cheerfully submitted.

"Southern Service Satisfies"

SYDNOR PUMP & WELL CO., INC.

RICHMOND, VIRGINIA

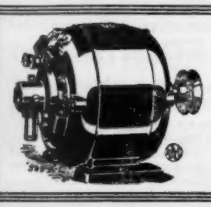
DEEP WELL DRILLING—WATER SUPPLY ENGINEERS

Twenty-Five Years Experience in Solving Water Problems

LUITWIELER NON-PULSATING DEEP WELL PUMPS

The Most Efficient Water Supply Equipment Made.

SYDNOR'S SUPREME SERVICE

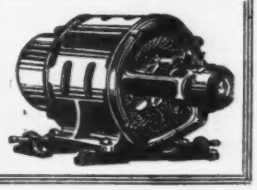


STANDARD ELECTRIC COMPANY

ELECTRICAL MACHINERY REPAIRED

Motors — Generators — Transformers — Armature Rewinding

1821 EAST MAIN ST. RICHMOND, VA.



BUYERS' INDEX—Continued.

Gallaudet Aircraft Corporation.
Hunt Machine Co., Rodney.
Mossberg Pressed Steel Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

REFLECTORS—LAMPS.
(See Lamp Reflectors.)

REGULATORS—LIQUID LEVEL.
Foxboro Co., Inc.
General Electric Co.

REGULATORS—PRESSURE.
Bristol Co.
Foxboro Co., Inc., The.
General Electric Co.
Taylor Instrument Co.

REGULATORS—TEMPERATURE.
(See Temperature Controllers.)

REINFORCING SLAG.
Birmingham Slag Co.

REPAIRING—ELECTRICAL.
Briggs-Shaffner Co.
Curtis Co., The.
Southern Electrical Supply Co.
Huntington & Guerry, Inc.
Westinghouse Elec. & Mfg. Co.

REPAIRING—TEXTILE MACHINERY, ETC.
Briggs-Shaffner Co.
General Machine Works.
Southern Spindle & Flyer Co.
Standard Electric Co.
Standard Gas Products Co.

RESTAURANT EQUIPMENT.
Sanymetal Products Co.

RIBBERS.
(See Knitting Machinery.)

RIB TOP CUTTERS.
General Machine Works.
Wildman Mfg. Co.

RING TRAVELERS—STEEL AND BRONZE.
Whitinsville Spinning Ring Co.
Whitin Machine Works.

RINGS—SPINNING.
(See Spinning Rings.)

ROCKER SHAFT BEARINGS.
(See Bearings.)

ROLLS—CALENDER.
Butterworth & Sons Co., H. W.
Textile Finishing Mchy. Co.
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.

ROLLS—RUBBER COVERED.
Butterworth & Sons Co., H. W.
Textile Finishing Mchy. Co.
Washburn & Sons, L. R.

ROLLS—STEEL.
Butterworth & Sons Co., H. W.
Southern Spindle & Flyer Co.
Textile Finishing Mchy. Co.
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.

ROLLS (WOODEN).
U. S. Bobin & Shuttle Co.
Washburn & Sons, L. R.

ROLL BEARINGS.
Hyatt Roller Bearing Co.

ROLLER CLOTH.
Philadelphia Felt Co.

ROLLER LEATHER.
Bond & Co., Chas.

ROOFING.
Barrett Co.
Certright Metal Roofing Co.
Dowman, George.
Dowman-Dozier Mfg. Co.
Richardson Co.
Southern Wood Preserving Co.
Wadsworth, Howland & Co.

ROOFING AUXILIARIES (PIPE GUTTERS—EAVE TROUGH—ETC.)
Dowman, George.
Dowman-Dozier Mfg. Co.

POOF AND CEMENT COATING.
American Cement Paint Co.
Barrett & Co.
Cooledge & Sons, F. J.
Detroit Graphite Co.
Hockaday Co.
Johnson & Co., Inc., Oliver.
Sonneborn Sons, Inc., L.
Wadsworth, Howland & Co.
Ware Paint Co.

ROPE—TRANSMISSION.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.
Link-Belt Company.

ROVING CANS.
(See Cans—Roving.)

ROVING MACHINERY.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

RUBBER SPECIALTIES (TEXTILE MILLS).
Textile Rubber Co.

RUBBER STAMPS.
(See Stamps, Stencils, Etc.)

SALTS.
(See Finishing & Sizing Materials.)

SANITARY PRODUCTS.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Sanymetal Products Co.
Taylor, Halsey W.
Vogel Co., Jos. A.
Walker Electric & Plbg. Co.

SASH-WINDOW—STEEL.
(See Window Sash.)

SAXOPHONES, ETC.
(See Musical Instruments.)

SCALES.
Toledo Scale Co.

SCALE PREVENTER—BOILER.
(See Boiler Feed Water Purification.)

SCREENS—MOVING PICTURE.
Southern Theatre Equip. Co.

SCREENS AND SIEVES—PERFORATED.
Allis-Chalmers Mfg. Co.
Erdle Perforating Co.
Knapp Fence Co.
Link-Belt Company.

SCOURING MACHINERY.
(See Washers—Cloth.)

SCRUBBING MACHINE—FLOOR.
American Scrubbing Equip. Co.

SCRUBBING AND WASHING POWDERS.
Mathieson Alkali Works.
India Alkali Works.
Warren Soap Mfg. Co.

SCUTCHERS.
Whitin Machine Works.

SECOND HAND MACHINERY AND SUPPLIES.
Nashville Industrial Corp.
Toomey, Frank, Inc.

SELVAGE HARNESS.
(See Harness.)

SEWING MACHINES.
Merrow Machine Co., The.
Textile Finishing Mchry. Co.

SHADES—ELECTRIC LAMP.
(See Reflectors.)

SHADES (WINDOW).
Aeroshade Co.

SHAFTING AND HANGERS.
Allis-Chalmers Mfg. Co.
Cresson-Morris Co.
Dodge Mfg. Co.
Fafnir Bearing Co.
Fulton Supply Co.
Hyatt Roller Bearing Co.
Link-Belt Company.
Skayef Ball Bearing Co.
Transmission Ball Bearing Co.

SHELVING—SECTIONAL STEEL.
Collins, J. D.
Dowman, George.
Dowman-Dozier Mfg. Co.
Hyatt Roller Bearing Co.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip & Eng'g Co.
Sanymetal Products Co.

SHINGLES—ASPHALT.
Barrett Co.
Dowman, George.
Dowman-Dozier Mfg. Co.

SHINGLES—METAL.
Certright Metal Roofing Co.
Dowman, George.
Dowman-Dozier Mfg. Co.

SHINGLES—WOOD.
Southern Cypress Mfg. Assn.
Southern Wood Preserving Co.

SHIPPING ROOM MACHINERY AND SUPPLIES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Collins, J. D.
Dixie Seal & Stamp Co.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
Smith Mfg. Co.
Standard Fibre Co.
Toledo Scale Co.

SHOWER BATHS AND CABINETS.
Crane Co.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

SHUTTLES.
Crompton & Knowles Loom Works.
Draper Corporation.
Jordan Mfg. Co.
U. S. Bobbin & Shuttle Co.
Williams Co., J. H.

SINGEING MACHINERY.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The.

SITES FOR FACTORIES.
(See Industrial Sites.)

SIZE BOX TEMPERATURE CONTROLLER.
Bristol Co.
Foxboro Co., Inc., The.

SIZE KETTLES AND TANKS.
(See Bleaching Kiers or Tanks.)

SIZING AND FINISHING COMPOUNDS.
(See Finishing and Sizing Materials.)

SKEWERS.
Jordan Mfg. Co.

SKYLIGHTS.
Dowman, George.
Dowman-Dozier Mfg. Co.
Knapp Fence Co.
Lupton's Sons Co., David.

SLAG FOR CONCRETE.
Birmingham Slag Co.

SLASHERS AND SLASHER ROOM SUPPLIES.
Butterworth & Sons Co., H. W.
Cole Mfg. Co., R. D.
Howard & Bullough.
Mossberg Pressed Steel Corp.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

SLASHER CLOTH.
Philadelphia Felt Co.

SLASHER HOODS.
Cole Mfg. Co., R. D.

SLASHER TAPE.
(See Tape—Slasher.)

SLATE ASPHALT ROOFING.
Barrett Co.

SLIDING PARTITION HARDWARE.
Dowman, George.
Dowman-Dozier Mfg. Co.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Sanymetal Products Co.
Wagner Mfg. Co.

SLUBBERS.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

SMOKE SCREENS.
Dowman, George.

SMOKE STACKS.
Casey-Hedges Co.
Dowman-Dozier Mfg. Co.
Wash & Weidner Boiler Co.

SOAPS—TEXTILE.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Ciba Co., Inc.
India Alkali Works.
Kali Mfg. Co.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Rohm & Haas Co.
Sonneborn Sons, Inc., L.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

SOFTENERS—COTTON.
(See Finishing & Sizing Materials.)

SOFTENERS—WATER.
(See Water Softeners.)

SOLDERLESS CONNECTORS—FRANKEL.
Westinghouse Elec. & Mfg. Co.

SOLOZONE.
Roessler & Hasslacher Chem. Co.

SOLVENTS.
(See Finishing.)

SPEEDERS.
Jordan Mfg. Co.
Parker & Co., Walter L.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobin Co.

SPEEDOMETERS.
(See Counters.)

SPINDLES.
Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Vermont Spool & Bobbin Co.
Whitin Machine Works.

SPINNERS.
(See Yarn Manufacturers.)

SPINNING FRAMES.
American Machine Co., H. & B.
Crompton & Knowles Loom Works.
Howard & Bullough.
Schaum & Uhlinger.
Saco-Lowell Shops.
Whitin Machine Works.

SPINNING RINGS.
Draper Corporation.
Fulton Supply Co.
Howard & Bullough.
Greist Mfg. Co.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

SPINNING TAPE SPECIALISTS.
American Textile Banding Co., Inc.
Barber Mfg. Co.

SPOOLING MACHINERY AND SUPPLIES.
Barber-Colman Co.
Draper Corporation.
Foster Mch. Co.
Mill Devices Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Whitin Machine Works.

SPOOLS AND SKEWERS.
Fulton Supply Co.
Jordan Mfg. Co.
Lestershire Spool & Mfg. Co.
Mossberg Pressed Steel Corp.
Parker Co., Walter L.
Textile Rubber Co.
U. S. Bobbin & Shuttle Co.
Vermont Spool & Bobbin Co.

SPRINKLER SYSTEMS.
American Moistening Co.

SPRINKLER TANKS.
(See Tanks, Towers, Etc.)

SPROCKETS.
Link-Belt Company.
Morse Chain Co.
Renold, Inc., Hans.

SPUR CAP SHELLS.
Gallaudet Aircraft Corporation.

STAMPS, STENCILS AND STENCIL MACHINES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Dixie Seal & Stamp Co.

STAND PIPES.
(See Tanks.)

STARCH AND GUMS.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co.
Corn Products Refining Co.
Kali Mfg. Co.
Keever Starch Co.
Mathieson Alkali Works, Inc.
Meta Co., H. A.
Pennick & Ford, Ltd.
Sonneborn Sons, Inc., L.
Staley Co., A. E.
Stein, Hall & Co.
Warren Soap Co.

STEAM ENGINES.
(See Engines—Steam.)

STEAM HOSE.
(See Hose—Fire.)

STEAM PUMPS.
(See Pumps—Steam.)

STEAM SEPARATORS.
(See Separators.)

STEAM TRAPS.
(See Traps—Steam.)

STEEL BUILDINGS.
Bogert & Carlough.
Dowman, George.
Maryland Metal Bldg. Co.

STEEL SASH.
(See Sash—Steel.)

STEEL SHELVING, DOORS, WINDOWS, PARTITIONS, ETC.
Bogart & Carlough.
Dowman, George.
Dowman-Dozier Mfg. Co.
Collins, J. D.
Lupton & Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Sanymetal Products Co.
Truscon Steel Co.

STEELS (STRUCTURAL).
Dowman, George.
Bogart & Carlough.

STENCILS AND STENCIL PAPERS.
(See Stamps and Stencils.)

STENCIL BRUSHES.
(See Marking Pots and Brushes.

STENCIL CUTTING MACHINES
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Dixie Seal & Stamp Co.

STICKS—PICKER.
(See Picker Sticks)

STOOLS.
(See Furniture—Mill.)

STOP WATCHES.
Bristol Co.
Silberberg, Mortimer J.

STOP MOTION.
Crompton & Knowles Loom Works.
Draper Corporation.
Eclipse Textile Devices, Inc.
Whitin Machine Works.
Wildman Mfg. Co.

STOKERS.
Westinghouse Elec. & Mfg. Co.

STORAGE RACKS.
(See Shelving.)

STRAPS (LUG, CHECK, HEEL, TUGGER, PICKER HARNESS, ETC.)
Atlanta Harness & Reed Co.
Bond Co., Chas.
Fulton Supply Co.
Hayes Loom Harness & Reed Co.
Jacobs Mfg. Co., E. H.
Garland Mfg. Co.

STRAPPING.
(See Leather Specialties or Check Straps.)

STREET LIGHTING FIXTURES.
Cutter Works, George.

SULPHIDES.
(See Finishing & Sizing Materials.)

SULPHUROUS ACID GENERATOR.
Macomb Machine Co.

SWINGS (PLAYGROUND).
(See Playground Equipment.)

SUPPLIES—GENERAL MILL.
Dodge Mfg. Co.
Fulton Supply Co.
Jenkins Bros.
Link-Belt Co.
Lunkenheimer Co.
Morse Chain Co.
Nashville Industrial Corp.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

SUPPLIES (OFFICE).
(See Office Equipment.)

SWITCHES—KNIFE-ELECTRIC.
Cutter Works, George.
Fulton Supply Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

SWITCHBOARDS—PANEL.
Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

SYSTEMS (BUSINESS).
Ernst & Ernst.

TAPES—MILL.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Sanymetal Products Co.

TACHOMETERS (RECORDING AND INDICATING).
Bristol Co.
Foxboro Co., Inc., The.
Root Co.

TALLOW.
(See Finishing Machinery.)

TANKS (ELEVATED).
Casey-Hedges Co.
Cole Mfg. Co., R. D.
Dowman-Dozier Mfg. Co.
Godfrey Conveyor Co.
Lombard Iron Works.
Walsh & Weidner Boiler Co
Woolford Wood Tank Co., G.

TANKS (SPRINKLER).
Cole Mfg. Co., R. D.
Lombard Iron Works.
Woolford Wood Tank Co., G.

TANKS (STEEL STORAGE).
Dowman-Dozier Mfg. Co.
Cole Mfg. Co., R. D
Godfrey Conveyor Co
Lombard Iron Works.
Walsh & Weidner Boiler Co.

TANKS (WOODEN).
Cocker Mch. & Fdry. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Mchry. Co.
Woolford Wood Tank Co., G.

TAPE LOOMS—COTTON.
Foster Mch. Co.
Fletcher Works.
Schaum & Uhlinger.

EUROPEAN PLAN
Rooms 600 Baths
Headquarters in Detroit for
OLD COLONY CLUB
DETROIT AUTOMOBILE CLUB

. . . DAILY RATES . . .
$2.50 up single
$5.00 up double
Two Floors of Agents' Sample Rooms—$5.00 per Day
Table d'Hote Dinner, $1.25
Business Men's Lunch, 65c
HOTEL TULLER
CAFETERIA O. C. FROMAN, Mgr. GRILLE

PUMPS
INDUSTRIAL — AGRICULTURAL — MUNICIPAL — RESIDENTIAL
A type for every service.
Bulletins on request.
The Goulds Manufacturing Company
SENECA FALLS, N. Y.
GOULDS

SOFT WATER - CLEAR WATER
FOR EVERY PURPOSE
DECALSO ZERO WATER SOFTENERS
LIME AND SODA WATER SOFTENERS
PRESSURE AND GRAVITY FILTERS

FOR PARTICULARS ADDRESS
AMERICAN WATER SOFTENER CO.
LEHIGH AVE. AT 4TH ST.
PHILADELPHIA, PA.

SOFTENER FILTER

The Name "Barber" Assures Your Satisfaction

It's hard to talk quality in spinning tape—it's a product that is almost a staple—many manufacturers believing there is no difference between one make and another and no amount of argument will change their opinion.

But regardless of the fact that "Barber" tapes contain just the proper weight and construction to insure long life and smooth, steady operation, there is a certain satisfaction in buying from Barber that is shown in the healthy growth of our business year after year. We believe it's due to the "knowing how" that we put into our product—a knowledge that is the experience of years dating back to the first tape drive put on a spinning frame. Then also, remember that we are spinning tape specialists and that "Barber" tapes set the standard.

"Barber" tapes are carried in an extensive stock for all kinds of textile machinery.

A wire to us at our expense will bring you service that all our customers like. Write us for prices.

Barber Mfg. Co.
Spinning Tape Specialists
LOWELL,
MASS.

BARBER
SPINNING & TWISTING TAPES

BUYERS' INDEX—Continued.

TAPES AND BRAIDS.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Weimar Brothers.

TAPES—SPINNING AND TWISTING.
Barber Mfg. Co.

TAPE MAKING MACHINES.
(See Bandage and Tape Machinery.)

TAPIOCA FLOUR.
Stein, Hall & Co.

TARPAULINS.
Smith Mfg. Co.

TAX SERVICE.
Ernst & Ernst.

TELEPHONE—CALLING SYSTEM.
Carter Electric Co.
General Electric Co.

TEMPERATURE REGULATORS.
Bristol Co.
Carrier Eng. Corp.
Foxboro Co., Inc., The.
General Electric Co.
Parks-Cramer Co.
Taylor Instrument Co.

TEMPLES.
Draper Corporation.

TENTS (ALL KINDS).
Smith Mfg. Co.

TENTERS.
Butterworth & Sons Co., The
Textile Finishing Mach. Co.

TENTER HOUSING & RECONSTRUCTING SYSTEM.
Proctor & Schwartz, Inc.

TENTER FRAME DRYERS.
Sturtevant Co., B. F.

TESTERS FOR YARN, FABRIC CORD, ROPE, RUBBER, WIRE, ETC.
Scott & Co., Henry L.

TEXTILE MACHINERY.
(See Cotton Mill Machinery.)

THEATRE EQUIPMENT.
Southern Theatre Equip. Co.

THERMOMETERS—ANGLE AND STRAIGHT STEM.
Bristol Co.
Foxboro Co., Inc., The.
Taylor Instrument Co.

THERMOMETERS—RECORDING AND INDEX.
Bristol Co.
Foxboro Co.
Taylor Instrument Co.

THERMOSTATS.
Bristol Co.
Foxboro Co.

THIN PLACE PREVENTERS.
Draper Corporation.

THREAD GUIDES.
Mitchell-Bissell Co.
Palmer Co., The I. B.

TILE ROOFING.
Richardson Co.

TIMBER.
(See Lumber.)

TIME CLOCKS.
(See Clocks.)

TIME RECORDERS.
Bristol Co.

TIERING MACHINES.
Collins, J. D.

TIES—BALING.
(See Bale Ties.)

TIRE FABRIC EQUIPMENT.
Fletcher Works.

TOILETS.
Crane Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

TOILET PARTITIONS.
Dowman, George.
Dowman-Dozier Mfg. Co.
Lupton's Sons Co., David.
Manufacturing Equip. & Eng'g Co.
Sanymetal Products Co.

TOOL CABINETS—STEEL.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.

TOOL STANDS—STEEL.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.

TOOLS (MACHINE).
Fulton Supply Co.

TOP FLATS RECOVERED.
Howard Bros. Mfg. Co.

TOWERS.
(See Tanks—Elevated.)

TRACTORS—ELECTRIC, INDUSTRIAL.
Collins, J. D.

TRANSMISSION—POWER.
(See Power Transmission Machinery.)

TRAPS—RETURN STEAM.
American Blower Co.
Morehead Mfg. Co.

TRAVELERS.
Fulton Supply Co.
Whitinsville Spinning Ring Co.

TRIPTODS.
U. S. Bobbin & Shuttle Co.

TROLLEYS & HOISTS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Machy. Co.
Euclid Crane & Hoist Co.

TRUCKS—AUTO.
White Co.

TRUCKS, BASKETS, ETC.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
National Vulcanized Fibre Co.
Smith Mfg. Co.
Standard Fibre Co.

TRUCKS—ELECTRIC—INTER.
Collins, J. D.

TRUCKS—HAND AND ELEVATING.
Collins, J. D.

TRUCKS, INTER, ETC.
Lewis Co., G. B.
Lyon Metallic Mfg. Co.
National Vulcanized Fibre Co.
Standard Fibre Co.

TUBS.
(See Tanks—Wooden.)

TUBING—METAL.
Dowman-Dozier Mfg. Co.
Youngstown Sheet & Tube Co.

TURBINES—HYDRAULIC.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

TURBINES—STEAM.
Allis-Chalmers Mfg. Co.
American Blower Co.
General Electric Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

TURBO UNDERGRATE BLOWERS.
American Blower Co.
Buckeye Blower Co.
Sturtevant Co., B. F.

TWISTING MACHINERY AND SUPPLIES.
Barber Mfg. Co.
Draper Corporation.
Foster Mch. Co.
Howard & Bullough.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
U. S. Bobbin & Shuttle Co.
Whitin Machine Works.

TYPEWRITERS.
Smith & Bros. Typewriter Co.

UNIONS—BRONZE.
Crane Co.
Fulton Supply Co.
Jenkins Bros.
Lunkenheimer Co.

URINALS.
Crane Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

VACUUM CLEANERS.
Sturtevant Co., B. F.

VACUUM GAUGES.
(See Gauges.)

VACUUM PANS.
Cresson-Morris Co.

VALVES—ANGLE, GLOBE, CROSS, BLOW-OFF, CHECK, GATE, POP-SAFETY, ETC.
Crane Co.
Fulton Supply Co.
Jenkins Bros.
Lunkenheimer Co.

VALVES—NON-RETURN STOP.
Crane Co.
Fulton Supply Co.
Jenkins Bros.
Lunkenheimer Co.

VARNISHES.
(See Paints.)

VATS.
(See Tanks—Wooden.)

VENTILATING APPARATUS.
American Blower Co.
Buckeye Blower Co.
Carrier Eng. Corp.
Dowman-Dozier Mfg. Co.
General Electric Co.
Parks-Cramer Co.
Philadelphia Drying Mchy. Co.
Sargent's Sons Co., C. G.
Sturtevant Co., B. F.
Tolhurst Machine Co.
Walker Electric & Plbg. Co.

VENTILATING & HEATING CONTRACTORS.
Dowman, George.
Dowman-Dozier Mfg. Co.
Walker Electric & Plbg. Co.

VENTILATING WINDOW SHADES.
Aeroshade Co.

VILLAGE ARCHITECTS AND DESIGNERS.
Robert & Co.
Sirrine, J. E.
Stunrman, Edw. A.

VILLAGE HOUSES.
(See Houses—Ready Built.)

VOLTMETERS AND AMMETERS.
Bristol Co.
Westinghouse Elec. & Mfg. Co.

WAGON AND CAR UNLOADERS.
Curtis Pneumatic Mchry. Co.

WALLBOARD.
Richardson Co.

WAREHOUSE—PORTABLE.
(See Buildings.)

WAREHOUSE DOOR HARDWARE.
(See Doors and Hardware.)

WAREHOUSE TRUCKS.
(See Trucks.)

WARP DRAWING MACHINE.
Barber-Colman Co.
Crompton & Knowles Loom Works.

WATT METERS.
(See Voltmeters.)

WARPERS AND WARPING MACHINERY AND SUPPLIES.
Auto Creel Corp.
Barber-Colman Co.
Brandwood, John.
Cocker Mch. & Fdry. Co.
Draper Corporation.
Foster Mch. Co.
Howard & Bullough.
Mill Devices Co
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Suter, Alfred.
U. S. Bobbin & Shuttle Co.

WASH BASINS.
(See Lavatories.)

WASHERS—CLOTH.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Hunt Machine Co., Rodney.
Klauder-Weldon Dyeing Mch. Co.
Philadelphia Drying Mchry. Co.
Textile Finishing Mchry. Co.
Tolhurst Mch. Wks.

WASHING POWDERS—FLOOR.
India Alkali Works.

WASTE BINS—STEEL.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.

WASTE MACHINERY—COTTON.
Howard & Bullough.
Logemann Bros.
Proctor & Schwartz, Inc.
Rex Eng. Corp.
Saco-Lowell Shops.
Sargent's Sons Corp., C. G.
Schofield Co., Wm.
Whitin Machine Co.

WASTE SEPARATORS.
(See Separators.)

WATCHES (TIME & STOP.)
Silberberg Co., Mortimer J.

WATCHMAN CLOCKS.
(See Clocks—Watchman.)

WATER COOLERS—FOUNTAIN.
Crane Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.

WATER SOFTENERS AND PURIFIERS.
American Water Softener Co.
Norwood Engineering Co.
Scaife & Sons Co., Wm. B.

WATER SUPPLY SYSTEMS.
Hughes Specialty Well Drilling Co.
Sydnor Pump & Well Co., Inc.

WATER TOWERS.
(See Tanks—Elevated.)

WATERPROOFING MACHINERY.
Butterworth & Sons Co., H. W.
Textile Finishing Machinery Co., The.

WEAVING.
(See Yarn Manufacturers.)

WELDING APPARATUS—ELECTRIC ARC.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

WELDING APPARATUS AND SUPPLIES—OXY-ACETYLENE.
Commercial Acetylene Supply Co.
Fulton Supply Co.
Oxweld Acetylene Co.
Standard Gas Products Co.

WELDING—JOB.
Briggs-Shaffner Co.
Standard Gas Products Co.

WELFARE ARCHITECTS.
(See Village Architects.)

WELFARE EQUIPMENT.
American Laundry Mchry. Co.
Cable Piano Co.
Crane Co.
Conn, Ltd., C. G.
Cutter Works, George.
Dowman-Dozier Mfg Co.
Everwear Mfg. Co.
Hill-Standard Co.
Home Canner Co.
Lyon Metallic Mfg. Co.
Manufacturing Equip. & Eng'g Co.
Minter Homes Co.
Rundle-Spence Mfg. Co.
Smith Mfg. Co.
Southern Theatre Equip. Co.
Taylor, Halsey W.
Westinghouse Elec. & Mfg. Co.

WELL DRILLING.
Hughes Specialty Well Drilling Co .
Sydnor Pump & Well Co., Inc.

WHEELS—FIBRE.
(See Fibre Products.)

WHEEL PULLER.
General Electric Co.

WHISTLES—STEAM AND AIR.
Crane Co.
Fulton Supply Co.
Jenkins Bros.
Lunkenheimer Co.

WHIZZERS.
Fletcher Works.
Tolhurst Mach. Wks.
Schaum & Uhlinger.

WINDERS.
Firsching, J. A.
Foster Mch. Co.
Howard & Bullough American Machine Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Universal Winding Co.

WINDOW FRAMES AND SASH—STEEL.
Bogart & Carlough.
Dowman, George.
Dowman-Dozier Mfg. Co.
Knapp Fence Co.
Lupton's Sons Co., David.
Truscon Steel Co.

WINDOW SHADES.
Aeroshade Co.

WIRES—DROP.
(See Drop Wires.)

WIRE FENCING, PARTITIONS & MACHINERY GUARDS.
Anchor Post Iron Works.
Cyclone Fence Co.
Dowman, George.
Knapp Fence Co.

WIRE GLASS WINDOWS.
Bogert & Carlough..
Dowman, George.
Dowman-Dozier Mfg. Co.

WIRE HEDDLES.
(See Heddles.)

WIRING CONDUITS AND FITTINGS.
(See Electric Machinery and Supplies.)

WIRING—ELECTRICAL.
(See Electrical Contractors.)

WOOD.
(See Lumber.)

WOOD BLOCK FLOORING.
Southern Wood Preserving Co.

WOOD BOXES.
(See Packing Cases.)

WOOD PRESERVERS
American Cement Paint Co.
Barrett Co.
Dixon Crucible Co., Jos.
Johnson & Co., Inc., Oliver.
Ware Paint Co.
Wardsworth, Howland & Co., Inc.

WOOD PULLEYS.
(See Pulleys.)

WOOD ROLLS.
Washburn & Sons, L. R.

WOOD TANKS.
(See Tanks.)

WOOLEN MACHINERY.
Butterworth & Sons Co., H. W.
Crompton & Knowles Loom Works.
Schofield Co., Wm.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Textile Finishing Mchry. Co.
Tolhurst Machine Works.
Whitin Machine Works.

YARN MANUFACTURERS.
Aberfoyle Mfg. Co.
American Yarn & Processing Co.
Boger & Crawford.
Callaway Mills, Inc.
Dixie Mercerizing Co.
Florsheim, H. A.
Hunter Mfg. & Comm. Co.
Philadelphia Felt Co.
Weimar Bros.

YARN DEALERS AND COMMISSION MERCHANTS.
(See Cotton Yarn and Cloth Commission Merchants and Dealers.)

YARN DRYERS.
(See Dryers.)

YARN DYERS.
(See Dyers.)

YARN TESTERS.
Scott & Co., Henry L.

CORTRIGHT METAL SHINGLES

Hand dipping shingles in molten zinc after they have been cut and stamped puts an even coating on both sides and on all edges.

We also make tightcoat and painted tin shingles.

CORTRIGHT METAL ROOFING CO.
Philadelphia — Chicago

Elevated Tanks
Boilers, Engines
Castings
Hosiery Dye Machines

R. D. Cole Mfg. Co.
Newnan, Ga.

Morehead Back-to-Boiler SYSTEM

Condensation Becomes Asset

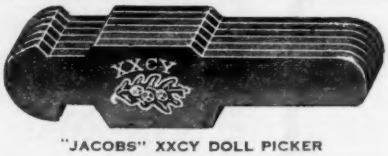
Instead of clogging your steamheated equipment and hindering steam circulation, condensation becomes an asset when it is immediately drained with the Morehead Back-to-Boiler System and returned at its original high temperature direct to boilers. Big savings are a certainty. Write for complete information.

Morehead Manufacturing Company
Dept. C, DETROIT, MICHIGAN
(69)

Liquid E.B.G. Chlorine

Our container equipment includes 100 and 150 pound Cylinders, Ton Drums, and Tank Cars.

Electro Bleaching Gas Co.
PIONEER MANUFACTURERS of LIQUID CHLORINE
Plant: NIAGARA FALLS, N.Y.
Main Office 18 E. 41st St. New York *Chicago Office* 105 W. Monroe St.



"JACOBS" XXCY DOLL PICKER
COTTON LOOM SIZE AND DUCK LOOM SIZE

Only pure oak bark tanned leather is used in this quality of picker, and it is treated by a secret process, giving a maximum of resiliency in the cushion or body where the shuttle strikes, which, it can be readily seen, represents the vital point of value in a loom picker.

The construction of this picker commends itself strongly. We should like to send all the samples you can use.

A Complete Line of "Jacobs" Loom Supplies Carried in Stock by all the Largest Supply Houses.

E. H. JACOBS MANUFACTURING COMPANY
DANIELSON, CONN.

FULTON SUPPLY CO.

70 NELSON ST., ATLANTA, GA.

Get Our Prices on

BOBBINS — SPOOLS — TRAVELERS —
CHECK STRAPS AND TEXTILE SUPPLIES

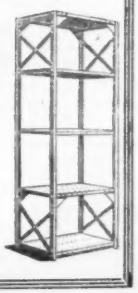
LEATHER BELTING
TRANSMISSION EQUIPMENT
PIPE
VALVES AND FITTINGS
PUMPS
MOTORS
LATHES
MACHINE TOOLS
WELDING OUTFITS AND SUPPLIES
ELECTRIC DRILLS
ETC.

COMPLETE STOCKS MILL SUPPLIES AND MACHINERY

Quality—Service—Right Prices

Steel Shelving

Lupton
INVESTMENT VALUE
PHILADELPHIA



Factory Equipment
From Warehouse Stocks

David Lupton's Sons Company
Amber St. and Allegheney Ave.
Philadelphia

Advertisers' Index

Aberfoyle Mfg. Co. 718
Aeroshade Co. 253
Alabama Power Co. 19
Aldrich Machine Works 252
Allis-Chalmers Mfg. Co. 299
American Blower Co. ..... *
American Cement Paint Co. ..291
American Industries Eng'g Co. 250-A
American Laundry Machinery Co. 244
American Machine Co., H. & B. 667
American Moistening Co. ..... *
American Scrubbing Equipment Sales Co. 255
American Supply Co. 254
American Textile Banding Co..267
American Water Softener Co..293
American Yarn & Processing Co. 282
Anchor Post Iron Works 678
Arnold, Hoffman & Co. 250
Atlanta Brush Co. 254
Atlanta Harness & Reed Mfg. Co. 287
Atlanta Rubber Stamp & Stencil Works 279
Auto Creel Corp. 258

Bahan Textile Mch. Co. 692
Barber-Colman Co. ...11 and 297
Barber Mfg. Co. 293
Barrett Co. ..... *
Beer Co., H. & B. 281
Belger Co. 256
Birmingham Slag Co. 30
Bogert & Carlough 34
Boger & Crawford 280
Bond & Co., Chas. ..... *
Borne, Scrymser Co. 249
Bosson & Lane 248
Bradley Mfg. Co., A. J. 698
Brandwood, John 46
Briggs-Schaffner Co. 291
Brinton Co., H. 710
Bristol Co. 273
Buckeye Blower Co. 56
Butterworth & Sons Co., H. W. 47

Cable Piano Co. ..... *
Callaway Mills, Inc. 281
Carlyle-Johnson Machine Co..274
Carrier Engineering Corp. 295
Carter Electric Co. 252
Carver-Beaver Yarn Co. 279
Casey-Hedges Co. 278
Central Dyestuff & Chemical Co. 702
Chisholm-Moore Mfg. Co. 275
Ciba Co., Inc. ..... *
Clipper Belt Lacer Co. 45
Cocker Mch. & Fdry. Co....250-A
Cole Mfg. Co., R. D. 295
Collins, J. D. 291
Conn, Ltd., C. G. ..... *
Cooledge & Sons, F. J. 271
Cooper Hewitt Electric Co. ... *
Corn Products Refining Co. 50
Cortright Metal Roofing Co. ..295
Crane Co. 300
Cresson-Morris Co. 274
Crompton & Knowles Loom Works 257
Curtis Co., The 289
Curtis Pneumatic Machinery Co. 277
Cutter Works, George ..... *
Cyclone Fence Co. 268

Davis, Roger W. 13
Detroit Belt Lacer Co. 276
Detroit Graphite Co. 27
DeVilbiss Mfg. Co. 243
Dixie Mercerizing Co. 718
Dixon Crucible Co., Jos. 702
Dixie Seal & Stamp Co. 297
Dodge Mfg. Co. 44
Dowman-Dozier Mfg. Co. 702
Dowman, George 34
Draper Corporation 3
Dryer Corp. of America ..... *
Dufur & Co. 289
Durant Mfg. Co. 688

Eclipse Textile Devices 259
Economy Baler Co. 287
Electro Bleaching Gas Co. 295
Emmons Loom Harness Co. ...289
Ernst & Ernst 676
Euclid Crane & Hoist Co. 276
Everwear Mfg. Co. 665

Fafnir Bearing Co. 6
Fawcett, Hughes 281
Firsching Co., J. A. 698
Fletcher Works 49
Florsheim, H. A. 279
Ford Co., J. B. 250
Foster Machine Co. ..... *
Foxboro Co. 247
Franklin Process Co. 2
Fulton Supply Co. 295

Gallaudet Aircraft Corp. 287
Garland Mfg. Co. 698
General Electric Co. 37
General Machine Works 712
Georgia Railway & Power Co... *
Godfrey Conveyor Co. 277
Goulds Mfg. Co. 293
Grasselli Chemical Co. 249
Graton & Knight Mfg. Co., The 275
Greist Mfg. Co. 262

Hayes Loom Reed & Harness Co. 266
Hemphill Co. 706
Hill Standard Co. 23
Hockaday Co. 253
Home Canner Mfg. Co. 266
Hopedale Mfg. Co. 259
Hotel Madison Square 282
Hotel Sheridan Plaza 285
Hotel Martinique 280
Hotel Tuller 293
Howard Bros. Mfg. Co. 252
Howard & Bullough Amer. Machine Co. 667
Hughes Specialty Well Drilling Co. 289
Hunt Machine Co., Rodney ...244
Hunter Mfg. & Comm. Co. ... 18
Huntington & Guerry, Inc. 1
Hyatt Roller Bearing Co. 36 and 43

India Alkali Works 251
International Eng'g Works ... *
Ivanhoe-Regent Works of G. E. Co. ..... *

Jacobs & Co., E. H. 295
Jacobs & Co. 250-B
Jamieson Co., J. B. 281
Jenkins Bros. 276
Johnson & Co., Oliver 26
Jordan Mfg. Co. 698

Kali Mfg. Co. 52
Keever Starch Co. 246
Klauder-Weldon Dyeing Mach. Co. 246
Knapp Fence Co. 669

La Frentz & Co., F. W. 281
Lane & Co., J. H. ..... *
Lennig & Co., Chas. 248
Lestershire Spool & Mfg. Co...261
Lewis Co., G. B. 264
Link-Belt Co. 39
Lockwood, Greene & Co. 25
Logemann Bros. 297
Lombard Fdry. & Mach. Wks...287
Lowell Crayon Co. 266
Lunkenheimer Co. 274
Lupton's Sons Co., David 295
Lyon Metallic Mfg. Co. 269

Macomb Machine Co. 245
Manufacturing Equip. & Eng'g Co. 267
Maryland Metal Building Co... 34
Mathieson Alkali Works, Inc... 51
Merrow Machine Co. 712
Metz & Co., H. A. 684
Mill Devices Co. 260
Minter Homes Co. 22
Mitchell-Bissell Co. ..... *
Monroe Calculating Machine Co. 686
Morehead Mfg. Co. 295
Morse Chain Co. 42
Mossberg Pressed Steel Corp...258
Murray Company, The 15

Nashville Industrial Corporation 38
National Aniline & Chemical Co. 54
National Paving Brick Manufacturers Assn. 33
National Vulcanized Fibre Co..267
New Brunswick Chemical Co...695
New York & New Jersey Lubricant Co. 669
Norwood Engineering Co. 246

Oxweld Acetylene Co. 682

Palmer Co., I. E. 264
Panton, Harrison D. 289
Parker Co., Walter L. 260
Parks-Cramer Co. 10
Pearson, Jos. T. 712
Pennick & Ford Co., Ltd. 247
Perry-Mann Electric Co. 271
Phila. Drying Machinery Co...244
Philadelphia Felt Co. 251
Proctor & Schwartz, Inc. 8 and 9
Prudential Insurance Co. of America ..... *

Quaker City Rubber Co. 250

Re-Fil-It Broom Mfg. Co. 255
Reliance Machine Works 712
Renold, Inc., Hans 289
Rex Engineering Corp. 263
Rhoads & Sons, J. E. ..... *
Robert & Co. ..... *
Richardson Co. 29
Roessler & Hasslacher Chemical Co. .....696 and 700
Rohm & Haas Co. 248
Root Co., The 688
Ross-Gould Co. 268
Roy & Sons Co., B. S. 297
Rundle-Spence Mfg. Co. 265

Saco-Lowell Shops 13
St. Louis Surfacer & Paint Co. .....31 and 32
Sandoz Chemical Co. 243
Sanymetal Products Co. 692
Sargent's Sons Corp., C. G. ...245
Scaife & Sons, Wm. B. 287
Schaum & Uhlinger 49
Schofield's Sons Co., J. S. ...278
Schofield Co., Wm. 287
Scott & Co., Henry L. 263
Scott & Williams, Inc. 705
Seawell, Luke 291
Showalter Printing Co., A. J...268
Silberberg Co., Mortimer J. ..260
Sirrine Co., J. E. 28
Skayef Ball Bearing Co. 5
Smith Mfg. Co. 265
Smith & Bros. Typewriter Co., L. C. 266
Sonneborn Sons, Inc., L. 297
Southern Cypress Mfg. Asso...269
Southern Electric Supply Co...291
Southern Spindle & Flyer Co...264
Southern Theatre Equip. Co.... 24
Southern Wood Preserving Co.690
Southwestern Broom Mfg. Co..254
Stafford Co. 4
Staley Mfg. Co., A. E. 249
Standard Electric Co. 291
Standard Fibre Co. 285
Standard Gas Products Co.....275
Steel Heddle Mfg. Co. 676
Stein, Hall & Co. 53
Stuhrman, Edw. A. 680
Surpass Chemical Co. 243
Sturtevant Co., B. F. 12
Suter, Alfred 258
Sydnor Pump & Well Co. 291

Taylor Co., Halsey W. 265
Taylor Instrument Co. 248
Terrell Machine Co. 690
Texas Co. 40
Textile Finishing Machinery Co.288
Textile Rubber Co. 17
Tennessee Electric Power Co. .....20 and 21
Toledo Scale Co. 264
Tolhurst Machine Works 671
Toomey, Frank, Inc. 283
Torrington Co., The 716
Transmission Ball Bearing Co.273
Trump Bros. Machine Co. 710
Truscon Steel Co. 7

United Chemical Products Co.. 43
Universal Winding Co. 715
U. S. Ball Bearing Co. 41
U S Bobbin & Shuttle Co. ...674

Variety Fire Door Co. ..... *
Vermont Spool & Bobbin Co...261
Vogel Co., Jos. A. 272

Wadsworth, Howland & Co., Inc. 718
Wagner Mfg. Co. 34
Walker Electric & Plumbing Co. 299
Walsh & Weidner Boiler Co. ..278
Want Ads 283
Ware Paint Co. 271
Warren Soap Mfg. Co. 688
Washburn & Son, L. R. 256
Weimar Bros. 279
Westinghouse Electric & Mfg. Co. 35
White Co. ..... *
Whitin Machine Works 14
Whitinsville Spinning Ring Co.262
Wiggins Co., John B. 267
Wildman Mfg. Co. 708
Williams & Sons, I. B. 16
Williams Co., J. H. 257
Wolf & Co., Jacques 251
Wonderlich Co., H. ..... *
Woodward, Baldwin & Co. ...279
Woolford Wood Tank Mfg. Co., G. 287

Youngstown Sheet & Tube Co.272

SONNEBORN PRODUCTS

"Fair" is not Good Enough for You

Find out how Sonneborn warp dressing helps you to get better weaving

There are many cotton mills today getting "fair" production that would get a good deal more if they heard the whole story of Sonneborn savings from one of our experts.

Amalol and Gluantine, the Sonneborn warp dressing preparations, are the results of years of study and research in our textile laboratories. These products are proving themselves a positive aid to the production of the highest quality weaving—helping to secure a uniform size regain. Daily performance in many prominent New England and Southern mills testifies to this.

There is a mill using Amalol and Gluantine in your vicinity. Write us for its name and the names of many other users of these products. Let one of our experts show *you in your plant* how scientific warp dressing will aid in getting quality weaving. *No obligation. Write.*

L. SONNEBORN SONS, Inc.
Manufacturing Chemists for the Textile Industry
116 Fifth Ave., N. Y.

AMALOL—for cotton warp dressing—GLUANTINE

SONNEBORN

B V C
TRADE MARK
WARP TYING MACHINES
WARP DRAWING MACHINES
AUTOMATIC SPOOLERS
HIGH SPEED WARPERS
HAND KNOTTERS
BARBER-COLMAN COMPANY
BOSTON, MASS. GREENVILLE, S.C.
MAIN OFFICE AND FACTORY
ROCKFORD, ILL. U.S.A.

GRINDING MACHINERY
for
Cotton and Woolen Cards
Garnets, Napper and Calender Rolls
B. S. ROY & SON CO.
Est. 1868
WORCESTER MASSACHUSETTS
Southern Agent, E. M. TERRYBERRY,
1126 Healey Bldg., Atlanta, Ga.

STENCILS
for any purpose. We make them promptly and properly.
DIXIE SEAL & STAMP CO. ATLANTA

BALING-PRESSES FOR ALL PURPOSES
HAND-OPERATED
BELT-DRIVEN ELECTRIC
HYDRAULIC
Both box and open types.
Write for full details.
LOGEMANN BROTHERS COMPANY
MILWAUKEE

MAIN OFFICE AND WORKS
PROVIDENCE, R. I.

NEW YORK OFFICE
HUDSON TERMINAL BLDG.

THE TEXTILE-FINISHING MACHINERY CO

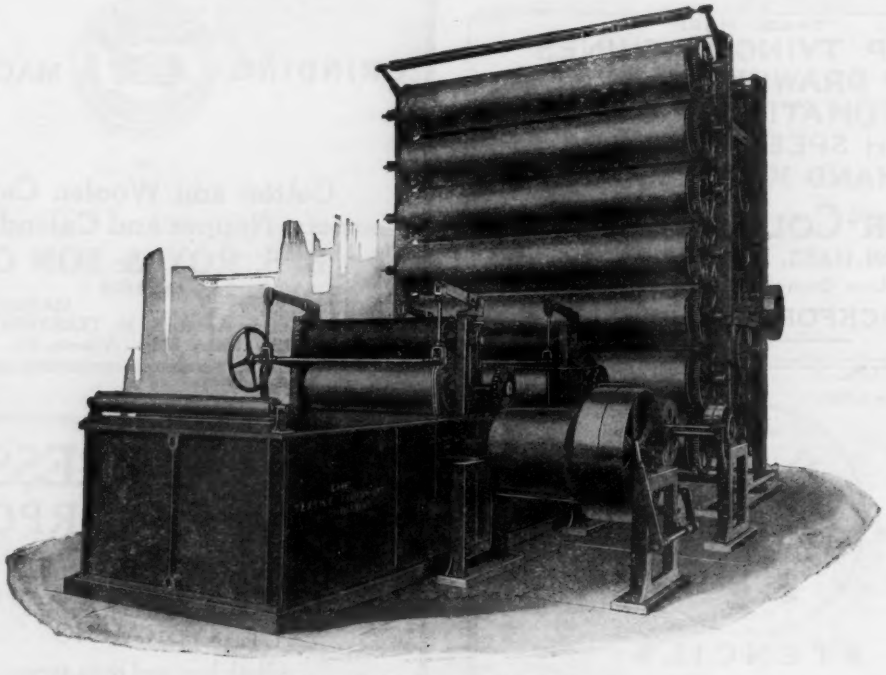
CANADIAN REPRESENTATIVES
WHITEHEAD, EMMANS, LTD.
MONTREAL

SOUTHERN REPRESENTATIVE
H. G. MAYER
CHARLOTTE, N. C.

YOUR INQUIRIES SOLICITED

FOR

Machinery for Singeing, Bleaching, Mercerizing, Dyeing, Drying, Printing and Finishing Textile Fabrics and Warps



Warp Washer and Dryer

PROPER LIGHTING

is an economical necessity in present-day textile mills. It not only increases general all-'round efficiency and cheerfulness of operatives, but decreases to a wonderful extent wasteful "hold-ups" and stoppages, spoilage and "seconds" as well as prevents accidents to a great extent.

Scientific lighting means not more light but the proper lights in the proper places. Our illuminating experts have solved the lighting problems and saved many dollars on installation cost for a number of the leading Southern mills. Walker Service is always a guarantee of perfect and permanent satisfaction and economy.

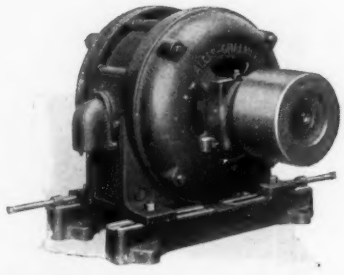
Scores of satisfied mills and the leading architects and engineers are our references. Write us for the handsome Walker book.

Modern industrial lighting. Note the uniformity of illumination.

WALKER ELECTRIC & PLUMBING CO
ATLANTA, GEORGIA.

Branch Offices at Convenient Points Throughout the South

Polyphase Induction Motors



Constant and Adjustable Speed

Types "AR" and "ARY" Induction Motors

A new Motor of new design throughout, taking full advantage of all improvements and advances made during recent years.

Type "AR" and "ARY" motors are designed with exceeding ruggedness, cast steel in place of cast iron being a prominent feature.

Method of ventilation is very effective resulting in even cooling and avoiding of "hot spots."

Bearings are of liberal design with spacious oil-wells.

Insulation is of highest grade, stator being treated with baked-on insulating varnish making the whole structure dust and moisture proof.

Motors are for floor or ceiling mounting being provided with very stiff and substantial rails.

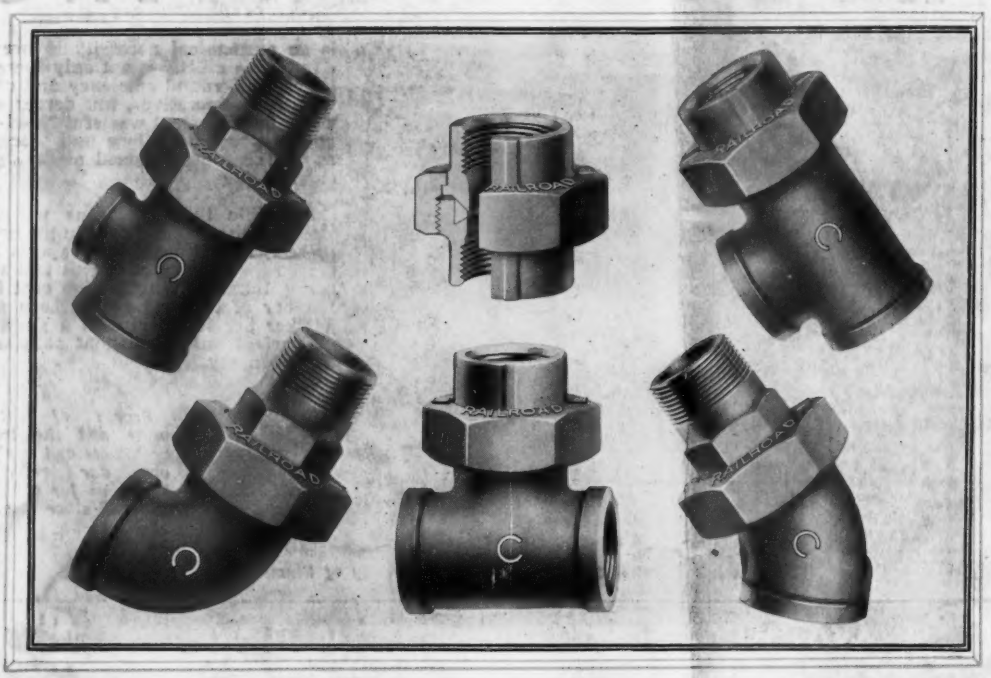
Conduit terminal boxes are regular equipment.

ALLIS-CHALMERS PRODUCTS
Electrical Machinery
Steam Turbines
Steam Engines
Gas and Oil Engines
Hydraulic Turbines
Crushing and Cement Machinery
Mining Machinery

ALLIS-CHALMERS MANUFACTURING COMPANY

MILWAUKEE, WISCONSIN. U.S.A.

ALLIS-CHALMERS PRODUCTS
Flour and Saw Mill Machinery
Power Transmission Machinery
Pumping Engines-Centrifugal Pumps
Steam and Electric Hoists
Air Compressors - Air Brakes
Agricultural Machinery
Condensers



CRANE "RAILROAD" UNIONS NEED NO GASKETS

Many piping systems can be simplified and their installation and upkeep costs lowered by using Crane *Railroad* fittings. For working steam pressures up to 200 pounds, these *Railroad* fittings are supplied in fourteen approved types, combining a brass-against-iron union and fitting in a single unit. No gaskets are ever needed. *Railroad* union connections can be broken down and reassembled to a sealed joint many times. Like all Crane valves, *Railroad* fittings are hydraulic tested before shipment to insure high quality.

CRANE

GENERAL OFFICES: CRANE BUILDING, 836 S. MICHIGAN AVE., CHICAGO

Branches and Sales Offices in One Hundred and Thirty-five Cities
National Exhibit Rooms: Chicago, New York, Atlantic City
Works: Chicago, Bridgeport, Birmingham, Chattanooga and Trenton

CRANE, LIMITED, MONTREAL. CRANE-BENNETT, LTD., LONDON
CRANE EXPORT CORPORATION: NEW YORK, SAN FRANCISCO
CIE CRANE, PARIS

Crane "Barracks" Lavatories